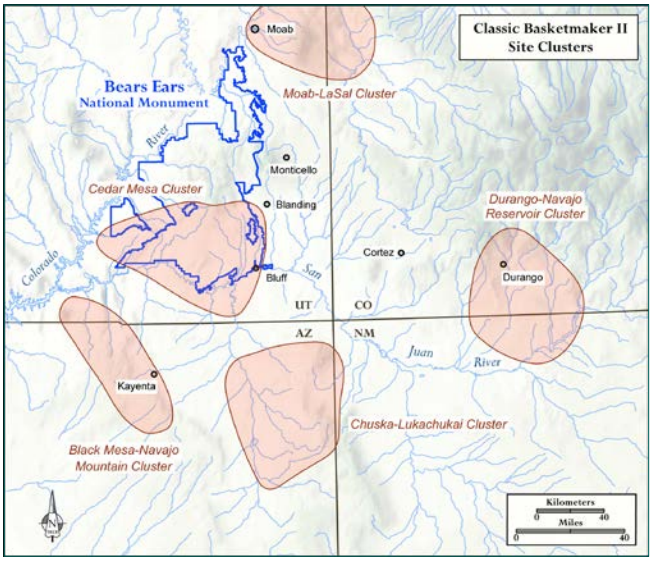
Regional Relationships beyond Bears Ears National Monument through Time

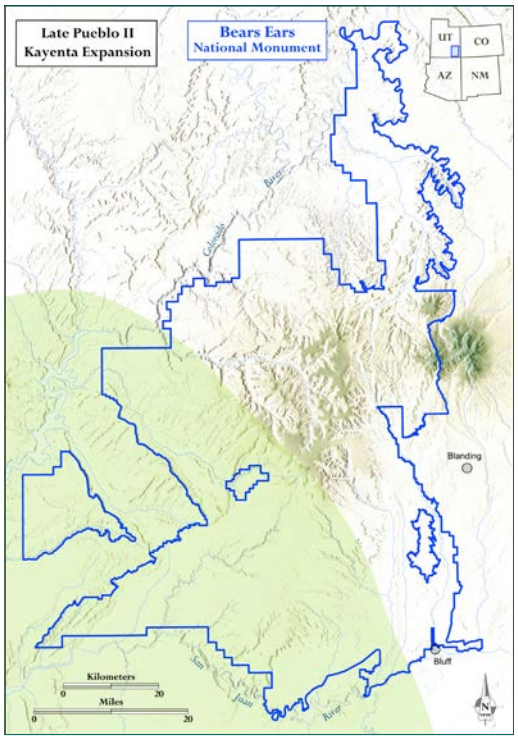
Now, we focus on larger-scale relationships between residents of Bears Ears National Monument and surrounding populations. The large number of external relationships underscores that Bears Ears National Monument represents a medium-scale cultural landscape nested within a much larger, dynamic, grand-scale cultural landscape.



Populations of Basketmaker II farmers clustered in areas with good growing conditions.

BASKETMAKER II POPULATION CLUSTERS

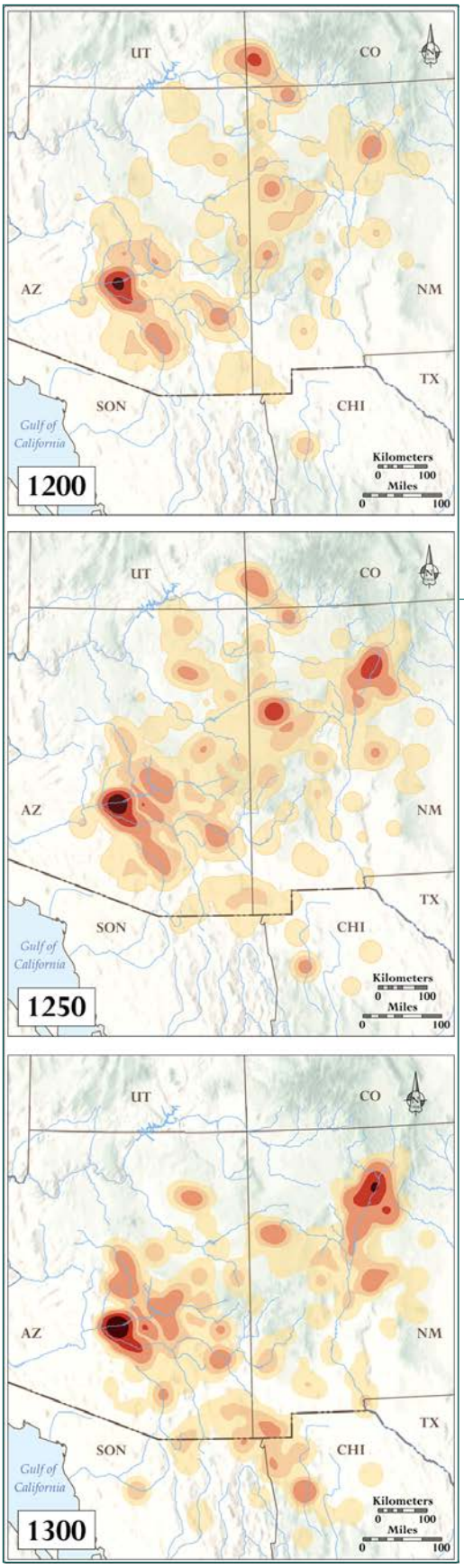
Previous research has shown that this time interval is particularly well-represented in the archaeological record of the Four Corners area. This map shows the locations of five population clusters researchers have thus far defined. This was an era of intensifying agriculture, increasing population, and reduced residential mobility (living in one place for longer periods of the year). This was an initial stage in the development of village life in this region. The nature of the relationships between these five documented population clusters offers great potential for future insights into this important human transition as well as general and particular processes of change.



Populations from south of the San Juan River moved into the Bears Ears region in the 1000s and early 1100s.

KAYENTA EXPANSION FROM SOUTH OF THE SAN JUAN INTO BEARS EARS NATIONAL MONUMENT DURING LATE PUEBLO II

Distinctive pottery and square kivas are markers of Kayenta groups that expanded northward into Bears Ears National Monument in Late Pueblo II times. This illustrates another period of population movement and social changes. It was also the prelude to the ultimate depopulation of this region by Ancestral Pueblo groups.



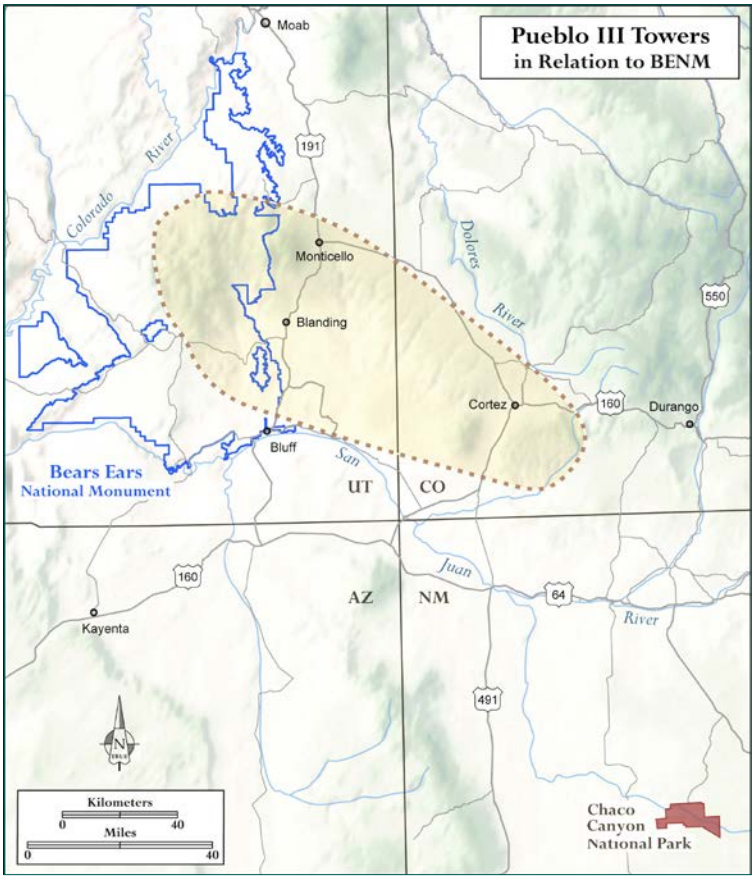
PUEBLO III TOWERS ACROSS THE NORTHERN SOUTHWEST

Current research suggests that tower structures started to be constructed in and around the Mesa Verde area during late Pueblo II times. They increased in numbers and expanded westward during Pueblo III times. A recent study highlighted the ideological role these towers may have had in ancient Pueblo identity.

REGIONAL DEPOPULATION IN LATE PUEBLO III TIMES

After some 1,300 years of dynamic, but apparently continuous, residence in the Four Corners region, there was a substantial depopulation of this area in the final 50 years of the 1200s. This map series shows the abrupt change in population that occurred over the course of the 1200s. In addition, research indicates that

Left: *Why did people leave the Four Corners region? Research in Bears Ears National Monument will help answer that question.*
Below: *Tower-building expanded west from the Mesa Verde area in the early 1200s.*



Connecting across the Landscape

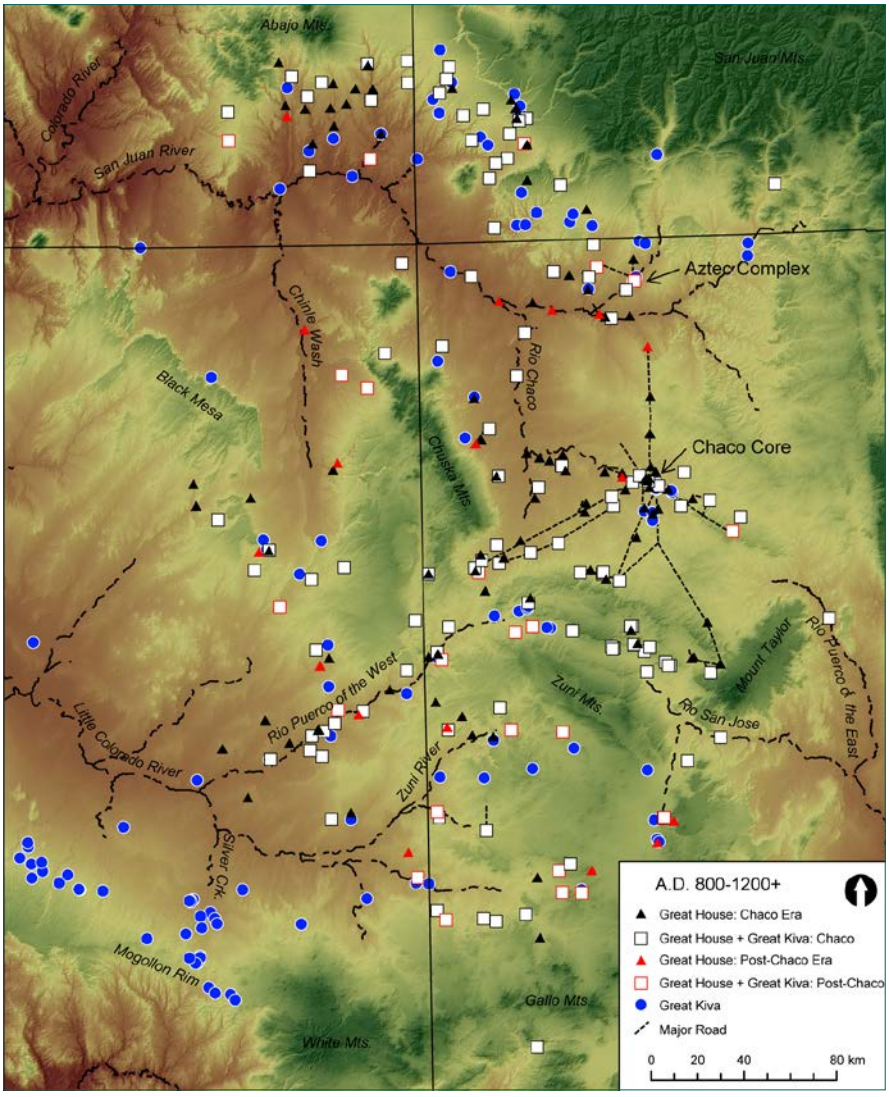
To ensure survival, people need to connect and collaborate with others. A common ideology and shared identity tend to be important ways for human groups to "get along." Tracing the development of shared and sometimes conflicting identities over the Bears Ears National Monument landscape and beyond will be an important focus of future research.

Economic ties and exchanges of goods often surmount differences in ideology or identity. There are multiple examples of areas within Bears Ears National Monument receiving inflows of new residents from adjacent areas—sometimes "connections" were made because new arrivals colonized formerly empty areas, and other times newcomers would have encountered others already in residence. Interaction, exchange, and population movement were important sources of cultural change over time in the Bears Ears National Monument region.

the movements of Kayenta groups and Mesa Verde populations out of the northern Southwest were dramatically different, in terms of the archaeological evidence they left.

THE CHACO WORLD IN SOUTHEASTERN UTAH

The dramatic cultural developments that were focused on Chaco Canyon in northwest New Mexico from about AD 800 until after AD 1200 extended north of the San Juan River into southern Colorado and southeastern Utah. Circular great kivas, great house architecture, and a remarkable system of roads define an extremely large area that is often referred to as the Chaco World. In southeastern Utah multiple road segments have been documented. They occur



The Chaco World as defined by the distribution of great kivas and great houses. The "Chaco Core" on this map is the location of Chaco Culture National Historical Park.

COURTESY OF MATT PEEPLES, CHACO SOCIAL NETWORKS PROJECT

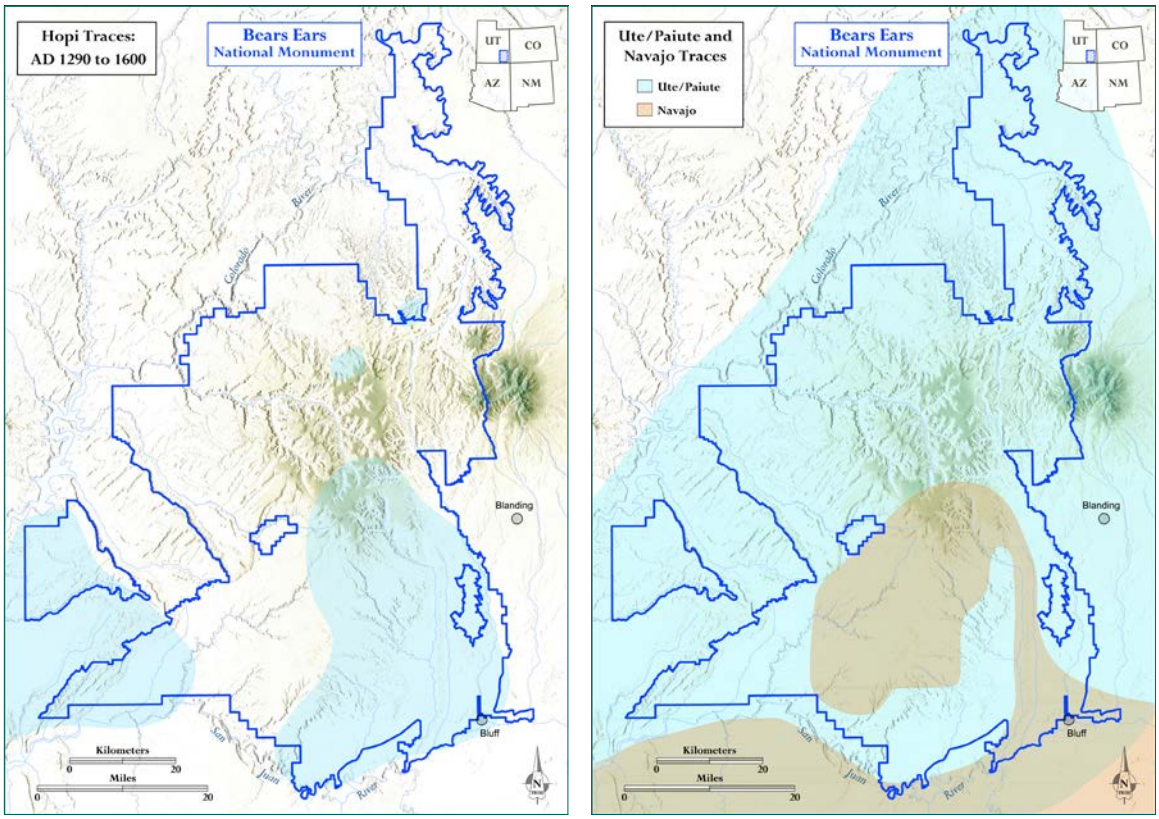
in relationship to great houses, some with great kivas. Distinctive u-shaped surface features called "herraduras" are also found associated with Chacoan roads in southeastern Utah. Excellent preservation due to lack of surface disturbance makes the Chacoan roads of southeastern Utah a particularly important, and ultimately fragile, resource.

ANCESTRAL PUEBLO PRESENCE IN BEARS EARS NATIONAL MONUMENT AFTER AD 1290

Sometimes even single artifacts carry a great deal of information (page 12). Archaeologists have noted an interesting pattern in the distribution of Hopi yellow ware pottery in small quantities in southeastern Utah during Pueblo IV (AD 1290–1500) times. Apparent Hopi shrines have also been noted in the area. Hopi people may have traversed this region during Pueblo IV times on expeditions to obtain salt, as suggested by a unique cache of materials found outside Bears Ears National Monument.

UTE/PAIUTE AND NAVAJO EARLY TRACES

Ute and Paiute groups are part of a broader Numic expansion of Uto-Aztecan speakers across and beyond the Great Basin that is still poorly understood. Documenting the archaeology of the arrival and subsequent use of Bears Ears National Monument by Ute and Paiute groups is a high priority.

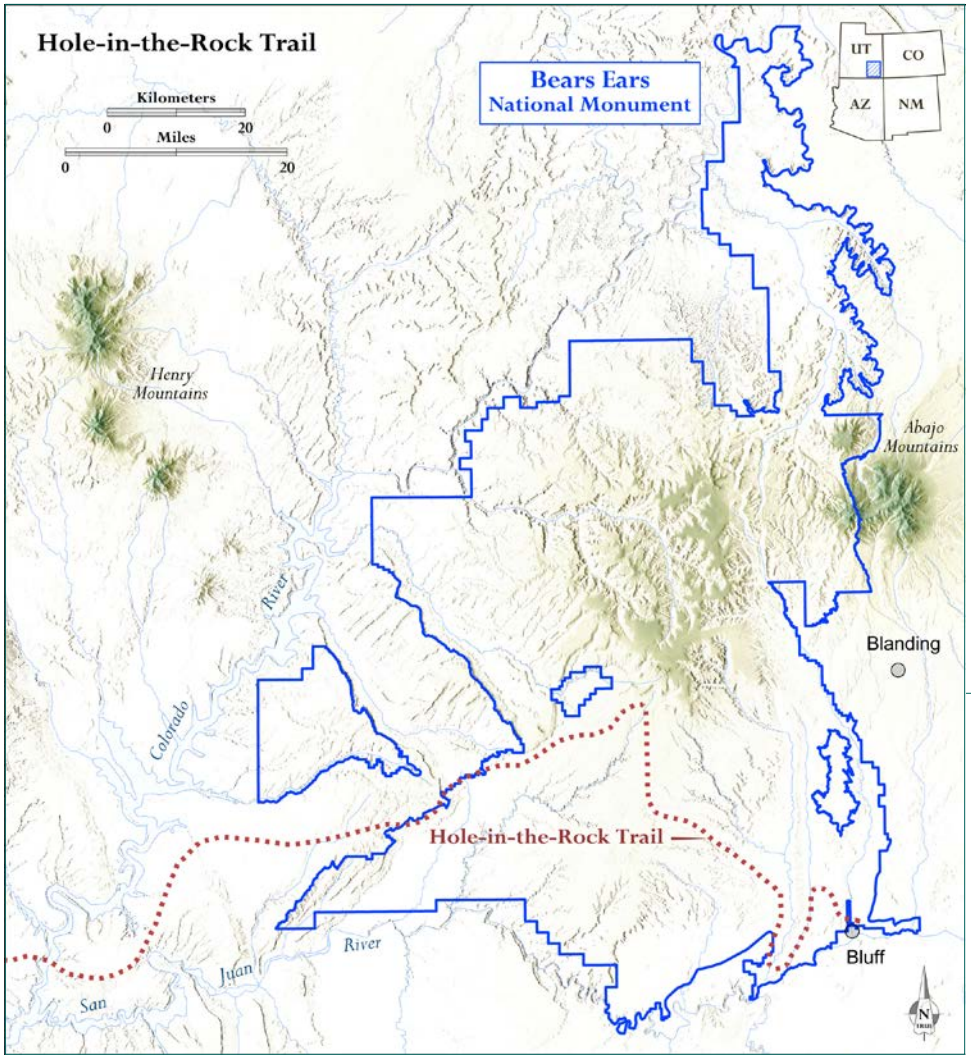


Upper left: *Archaeologists have documented Hopi pottery and shrines dating after the depopulation of the late 1200s.* ***Upper right:*** *We have much to learn about Ute/Paiute and Navajo expansion into the Bears Ears region.*

Similarly, documentation of Navajo populations' movements into Bears Ears National Monument after 1500 is also a high research priority.

MORMON MOVEMENT INTO BEARS EARS NATIONAL MONUMENT

The movement of Mormon settlers into southeastern Utah began in autumn 1879 with a party of 230 pioneers. Their harrowing journey involved descent through a narrow rock passage to cross the Colorado River, followed by a difficult trek into what is now Bears Ears National Monument to get around Grand Gulch, and another difficult passage through Comb Ridge. They determined to halt their journey and established a settlement at Bluff in April 1880. Note the broad swath through the Bears Ears National Monument area shown in the map at left, which is the broad swath of the National Register designation of the trail followed by these Hole-in-the-Rock pioneers.



Top left: *Nineteenth-century Navajo male hogan, Butler Wash, in 2009. In 2012, campers kicked down this structure and used it for firewood.* PHOTO: WINSTON B. HURST ***Bottom left:*** *The Hole-in-the Rock Trail crosses a portion of Bears Ears National Monument.*

Tracing Ideologies and Past Identities through Rock Art Styles and Their Distributions

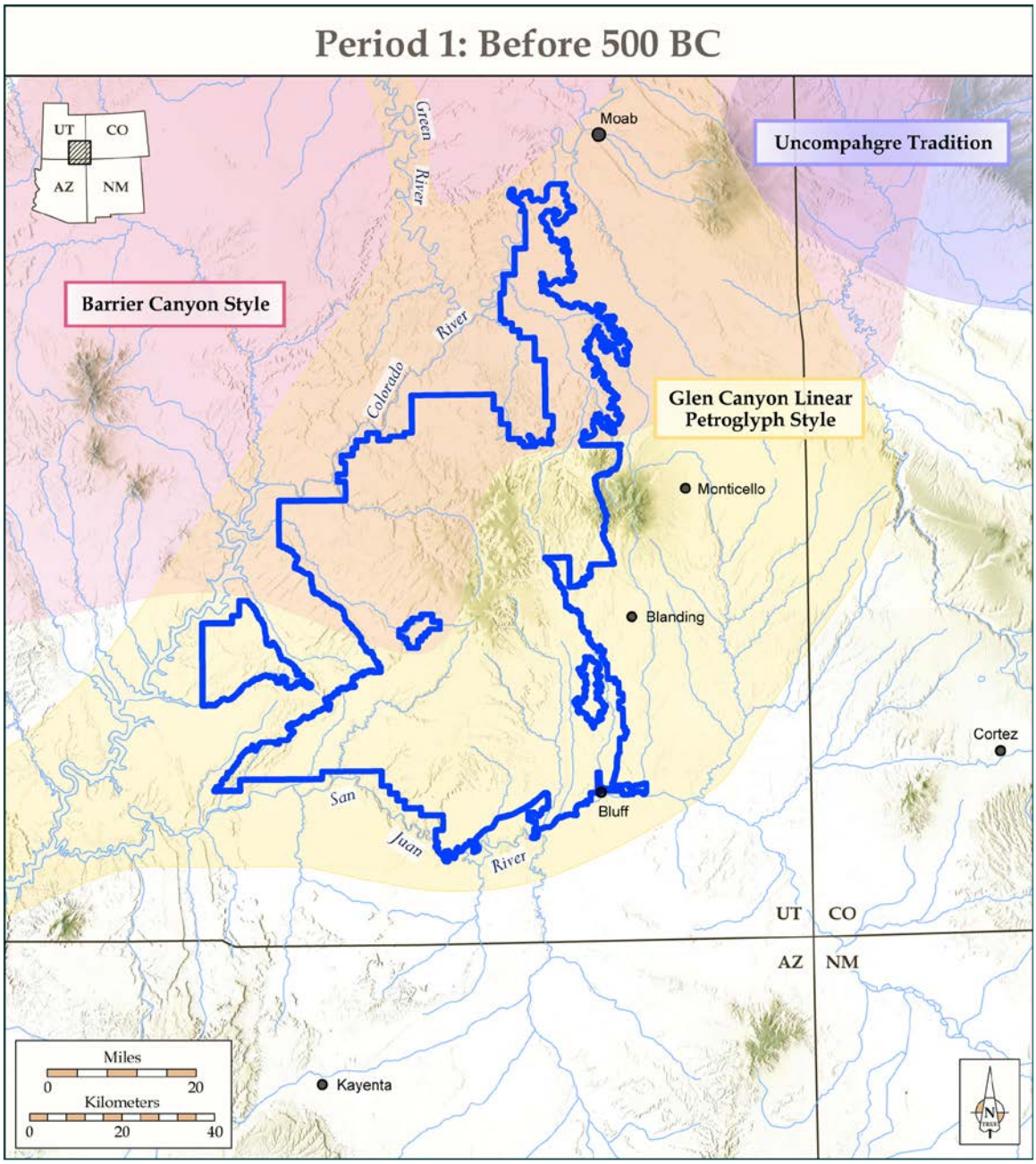
In his 2010 book, *Traces of Fremont*, author and archaeologist Steven Simms wrote: "The symbols and figures in Fremont rock art are part of an ideological fabric stretched across a sacred landscape." This eloquent statement provides a useful framework for thinking about the striking and abundant rock art of the Bears Ears National Monument.

Archaeologists who have spent substantial effort in recording and analyzing the spatial distribution, stylistic patterns, and broad time sequences of major rock art styles across the northern Southwest have outlined a basic framework for classifying the rock art of the greater Bears Ears region. This information is displayed on four maps (pages 33–39) as broad spatial distributions. What is most striking is that multiple styles tend to come together in and around Bears Ears National Monument. It is the landscape-scale spatial distribution of these styles that is most important, however—not the classification of single images.

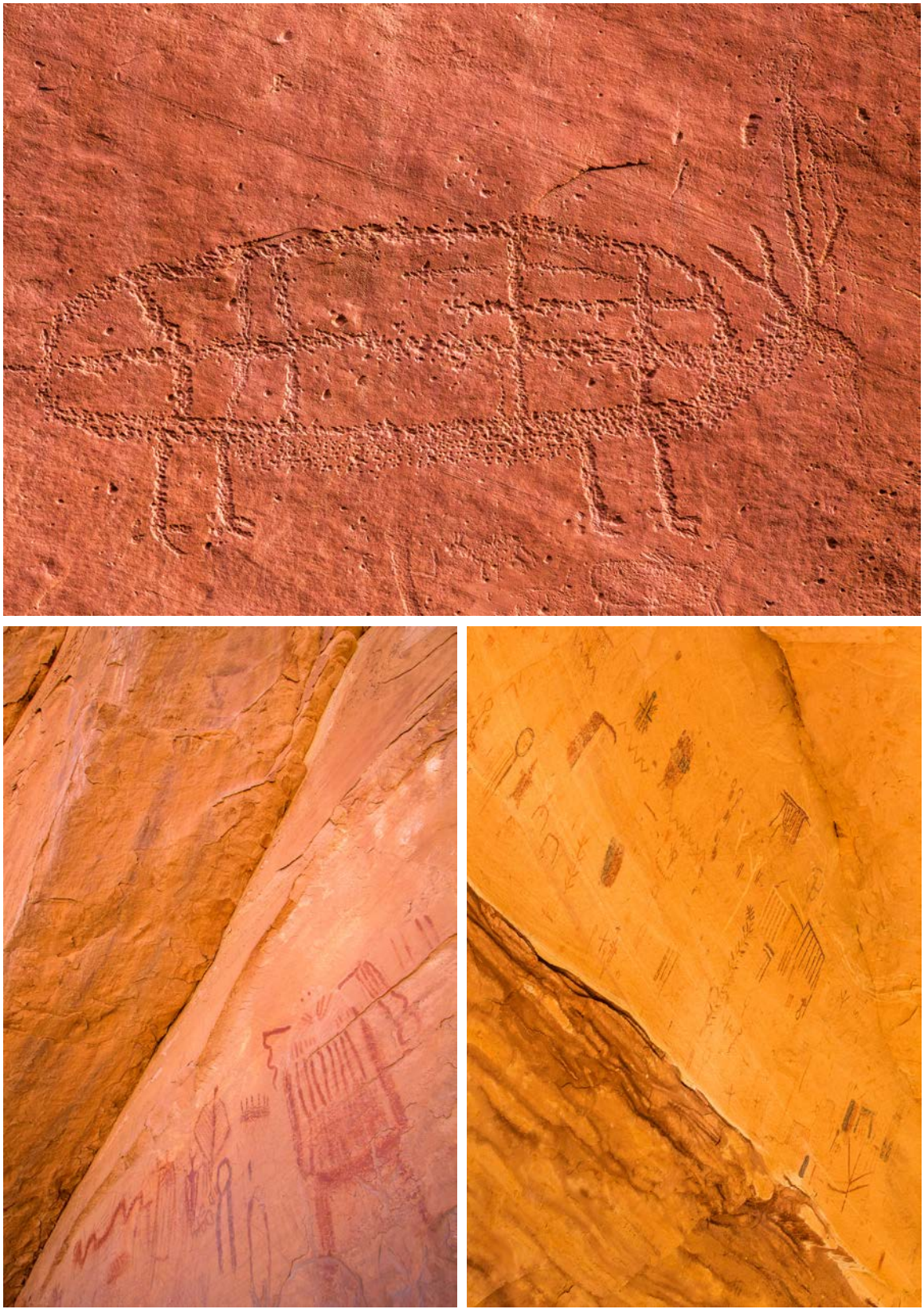
Archaeologists have invested much less effort in the study of rock art than they have in other aspects of the archaeological record. There is, however, a welcome trend toward fully integrating rock art as a critical information source in archaeological research. This means focusing on the environmental setting of rock art sites, carefully documenting the distribution of artifacts and architecture associated with the site, developing ways to carefully document chronological patterns within and between rock art sites, and using new theoretical approaches to improve insights into the role of rock art as communication in past social networks and religious practices.

The rock art styles that archaeologists have defined may be placed in four broad temporal groups: Period 1: Before 500 BC, Period 2: 500 BC to AD 750, Period 3: AD 750 to 1500, Period 4: Post AD 1500.

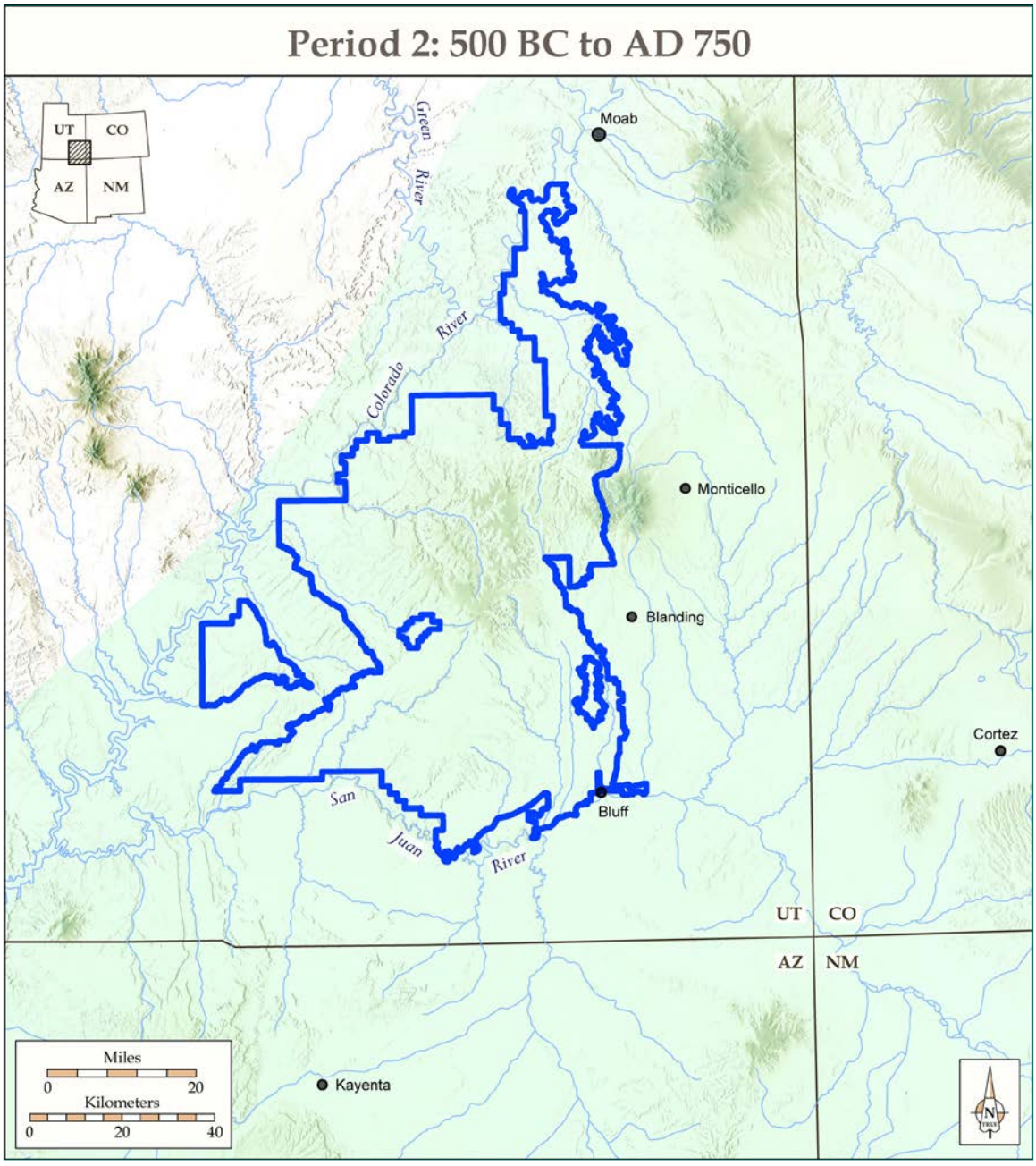
San Juan Anthropomorphic Style. PHOTO: R. E. BURRILLO



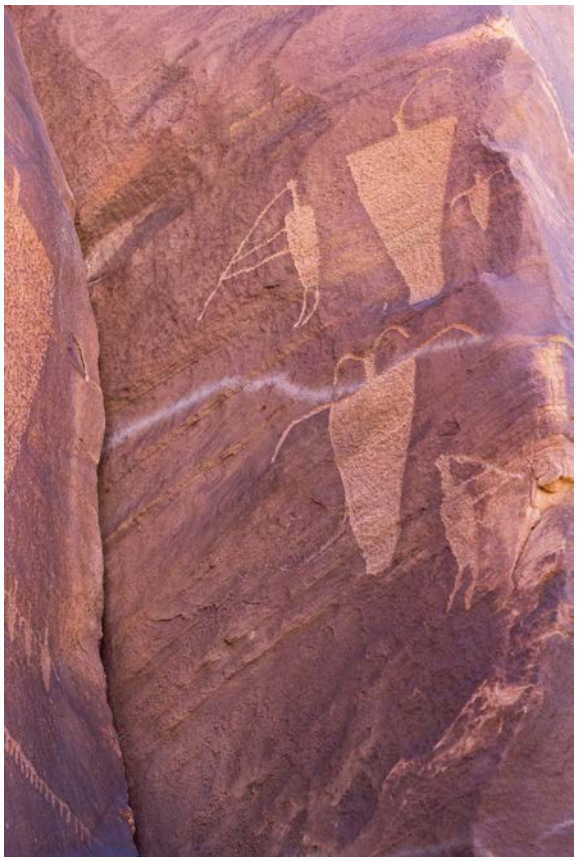
Period 1 *rock art falls into the broad Archaic category and dates to 500 BC or earlier. It includes many different traditions; Barrier Canyon Style, Glen Canyon Linear (Style 5), and the Uncompahgre Tradition distributions are shown on the map. Other styles that cover extensive areas, but are rare in Bears Ears National Monument, and therefore are not mapped, include the Abstract Geometric Painting Tradition (Monochrome and Polychrome) and the Abstract Geometric Petroglyph Tradition.*

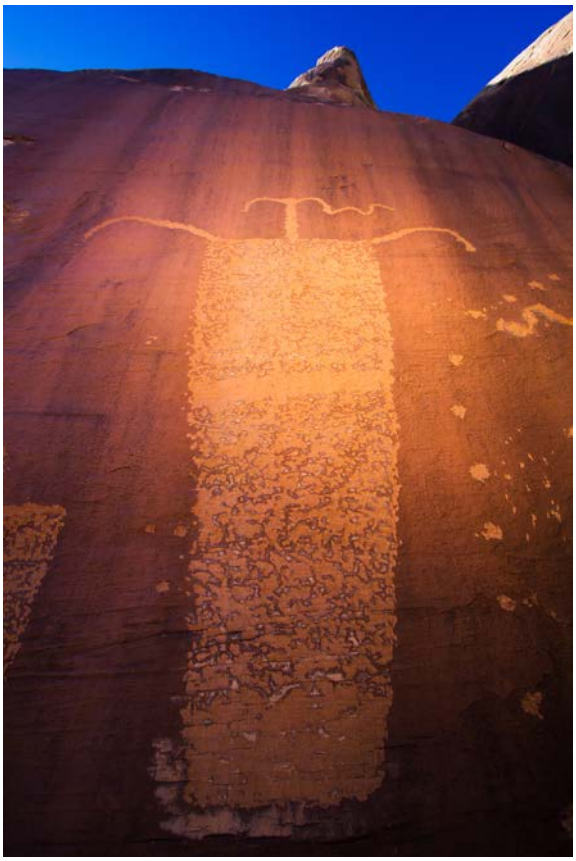


Top: *Glen Canyon Linear Style 5.* ***Bottom left:*** *Barrier Canyon Style.* ***Bottom right:*** *Archaic Polychrome Abstract Style.* PHOTOS: JONATHAN BAILEY

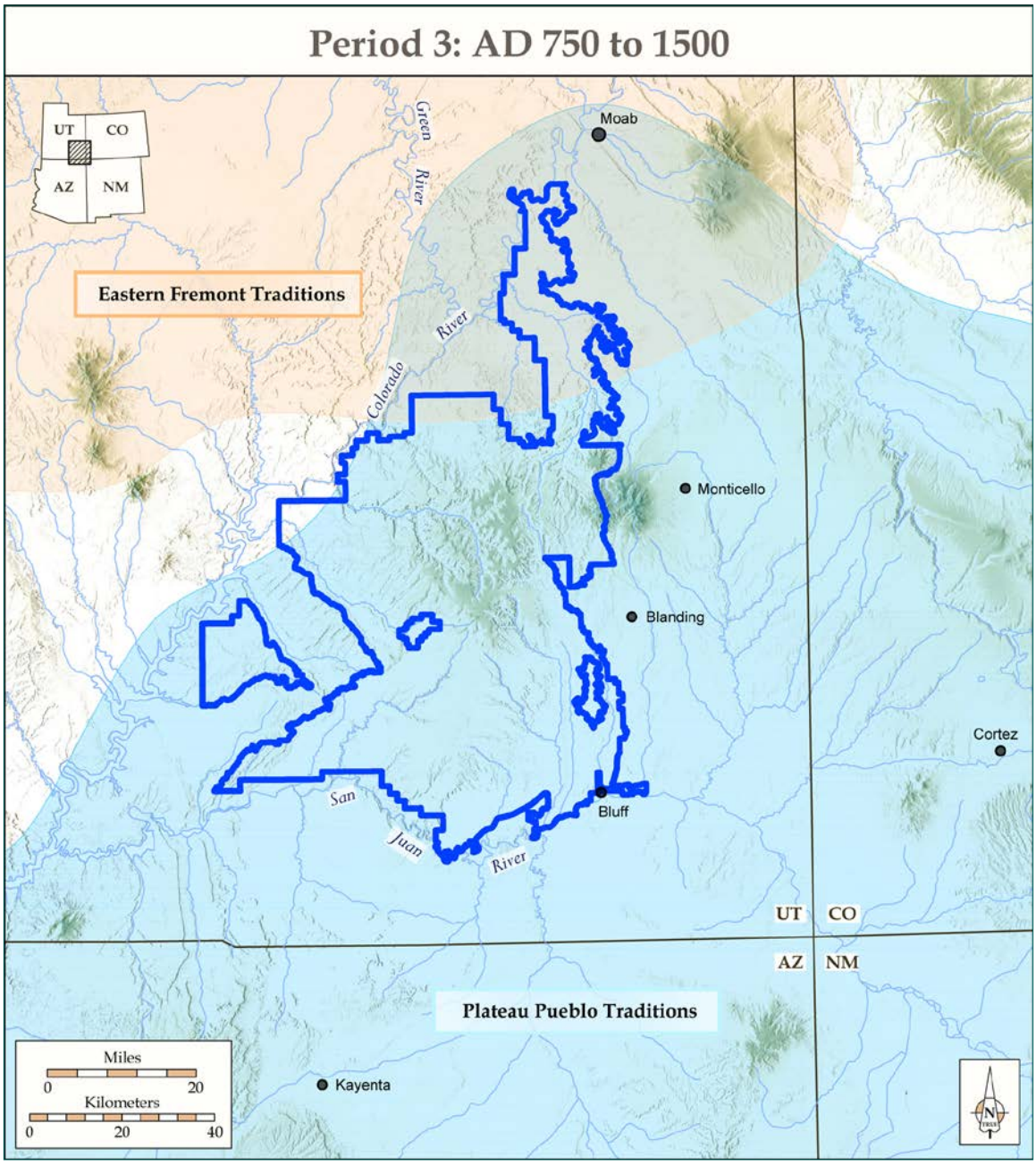


Period 2 *represents the agricultural Basketmaker Traditions (Western and Eastern San Juan styles; Abajo La Sal style).*



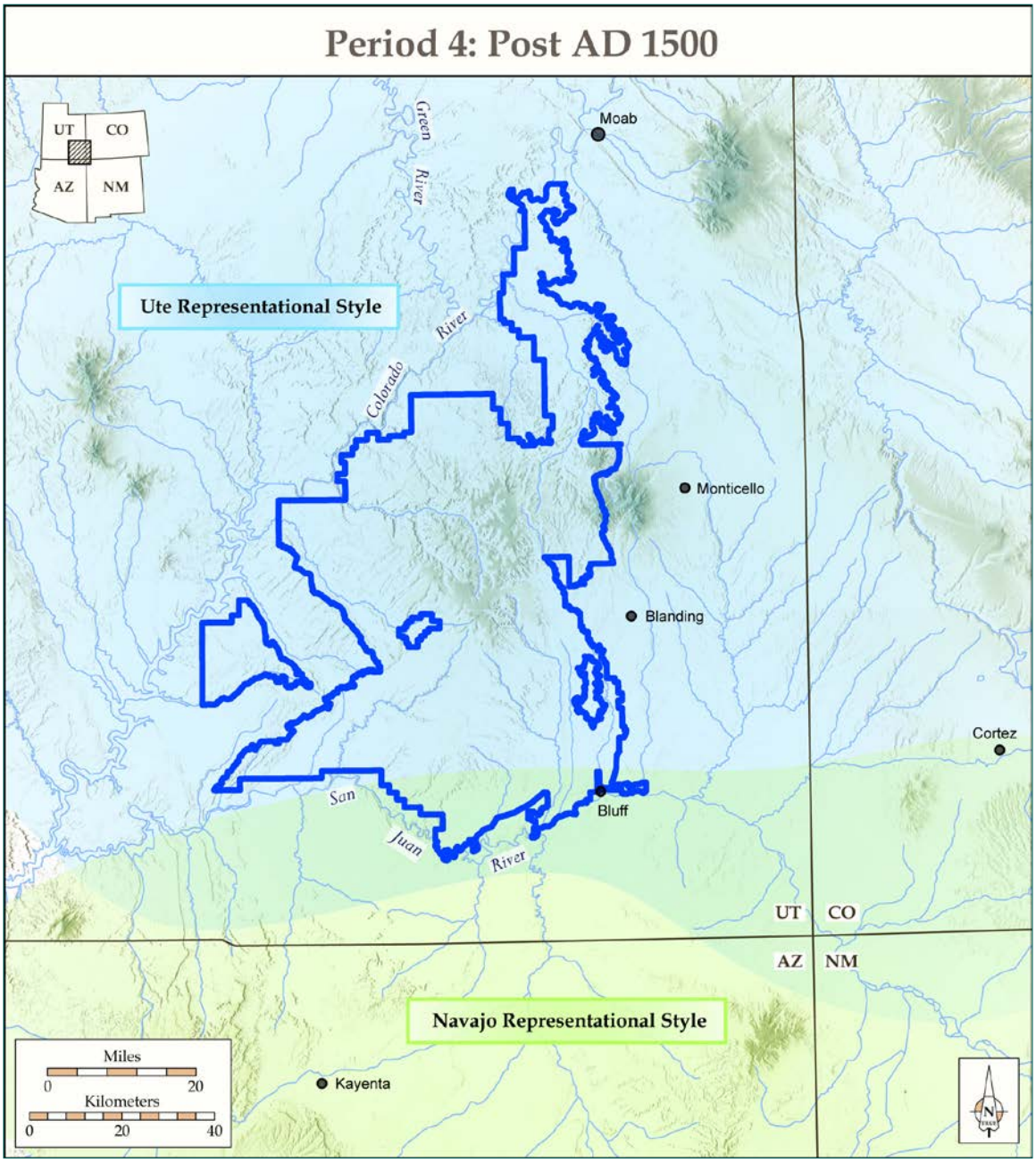


Top: *San Juan Anthropomorphic Style.* ***Bottom left and right:*** *La Sal Style petroglyphs.* PHOTOS: JONATHAN BAILEY



Period 3 *reflects agricultural peoples of Bears Ears National Monument, who left a dramatic array of petroglyphs and pictographs across Bears Ears National Monument, including the Eastern Fremont Tradition (Uintah Fremont and Tavaputs-San Rafael Fremont traditions), and Plateau Pueblo Tradition (Late Basketmaker III/Pueblo I, Pueblo II–III, Pueblo III–IV).*

Top: *Fremont Southern San Rafael Style.* ***Bottom left and right:*** *Kayenta Representational Style.* PHOTOS: JONATHAN BAILEY



Period 4 *rock art is attributed to Paiute or Ute groups and Navajo groups. It dates after 1500 and extends to the mid-1900s. Firm identification of which cultural group created this rock art is often difficult. Horses are a common theme, and similar yet diverse techniques for making the images were used by both groups.*

Upper left: *Navajo Representational Style.* PHOTO: JONATHAN BAILEY ***Upper right:*** *Navajo Representational Style.* PHOTO: WILLIAM H. DOELLE ***Right and below:*** *Ute Representational Style.* PHOTOS: WILLIAM H. DOELLE

Future Research Goals

The final session of the assembled experts sought to identify research issues that were important for the future. Several people suggested prioritizing areas where we anticipate impacts from increased visitation to Bears Ears National Monument, and some raised concerns about establishing baseline condition information for such areas. Experts also identified a number of topics that should contribute to better interpretive information for visitors.

REFINE the dating of artifacts, rock art styles, pottery styles, architecture, and other components of the archaeological record in order to better understand periods of stability or change in the past.

CONTINUE intensive sampling of wood in preserved architecture throughout Bears Ears National Monument, as these materials are threatened and the precise chronological information from tree-ring dating is invaluable.

DOCUMENT the source locations of raw materials used to make stone tools. Identify the sources of distinctive types of stone people used to make tools in order to help us determine patterns of mobility, patterns of exchange, and changes in technology.

UPGRADE the archaeological site inventory. This is a high priority and will involve effort in several different settings.

- Large numbers of archaeological site records and information on past survey locations are not included in Utah's official geospatial database. This is particularly true for older academic studies, but also there is a time lag for getting records from cultural resource management studies into this digital database.
- Many known archaeological sites have never actually been recorded by archaeologists.
- Plan and implement sample surveys in order to develop scientifically sound estimates of site populations for various portions of the Monument and as a way to develop predictive models useful in Monument planning and management.
- Plan and implement surveys to update site-condition information on previously recorded sites in areas most likely to sustain impacts from increased visitation.

EXAMINE cultural change. Because Bears Ears National Monument is located at the edges of multiple major regional cultural traditions, it is an ideal place to study past cultural change.

Many transitions took place quite rapidly in the Bears Ears National Monument region, and these are highly visible in the archaeological record.

PRIORITIZE documenting, dating, and interpreting the many well-preserved structures, popularly termed "cliff dwellings," in naturally sheltered locations in the Monument's canyons.

- Few areas in the Southwest have the variety and degree of preservation exhibited by the cliff dwellings of the Bears Ears.
- The cliff dwellings are a major focus of public interest and require planning to protect them from the impacts of increased visitation.

APPLY new, increasingly holistic approaches to the study of Bears Ears National Monument's truly magnificent rock art. Develop a comprehensive, large-scale program of rock art research toward multiple benefits.

- These are extremely fragile resources, so documentation is the first step in planning for long-term preservation.
- These resources inspire broad public interest. Even informed, low-impact visitation can result in cumulative damage over time.
- Interpretation through new, creative research may have broad public benefits.
- Rock art has substantial potential for collaborative research programs involving tribal experts.

FOCUS ON evidence of Archaic hunter-gatherers throughout Bears Ears National Monument.

- Experts noted the potential for a predictive model to guide a major research effort to document Archaic period activity.
- Experts raised a specific question about the Late Archaic presence in Bears Ears National Monument: Did Basketmaker II populations displace an existing population, or did they settle a very lightly used area?

INVESTIGATE the effects of the Chaco World in southeastern Utah. Chaco was a strong and vast ritual, economic, and social phenomenon of the AD 800s–1100s. This topic had broad interest among the experts, who identified several issues or research topics to pursue.

- In Pueblo I, people left Cedar Mesa, and people built the first great kivas and villages in eastern Bears Ears National Monument and beyond—why? (Great kivas were community ritual structures that served to integrate local and regional populations as people began living together in larger, village-scale settlements.)
- What is the history of early great kivas and the communities that built them, and how do they relate to subsequent developments of Chacoan great houses in southeastern Utah?
- The high degree of preservation of the local landscape and the ways in which Chacoan roads and

associated settlements and features are increasingly documented highlighted the need to further document and protect a broad "roaded landscape."

- New technology, such as LIDAR, will be helpful in documenting subtle roads in heavily vegetated areas.
- Several researchers suggested that much of Four Corners archaeology might be interpreted as engagement with or resistance to the Chaco World.

EXPLORE northward Kayenta movement into the southwestern area of Bears Ears National Monument.

- Why did Kayenta groups expand northward into the southwestern portion of Bears Ears National Monument?
- What was the nature of the interaction between Kayenta groups and Mesa Verde affiliated populations that were moving into Bears Ears National Monument from the east?

CONSIDER the role of cotton within Bears Ears National Monument and the larger Mesa Verde region.

- People probably grew cotton at some low-elevation settings within Bears Ears National Monument or even more likely to the west along the Colorado River and its tributaries.
- There is evidence of processing and weaving cotton in Bears Ears National Monument, and it is likely that raw cotton and completed textiles were traded eastward to the Mesa Verde area.
- Studies of perishables of cotton and other materials are ongoing through the Cedar Mesa Perishables Project (friendsofcedarmesa.org/perishablesproject/).

INVESTIGATE westward Mesa Verde movement into Bears Ears National Monument. Some of this is evidenced by pottery styles, but public architecture in the form of towers (page 28) has a significant presence within Bears Ears National Monument.

EXAMINE regional depopulation of the Four Corners. This is a research question of very long-term interest in archaeology. There is still a great deal of future research that could be pursued.

STUDY Paiute and Ute arrival and subsequent history in Bears Ears National Monument. This has received very little attention to date. It is a high priority because the archaeology is very subtle, and therefore requires focused research strategies. This archaeology is also very fragile and thus threatened by increased visitor activity.

STUDY Navajo arrival and subsequent history in Bears Ears National Monument. Like Paiute and Ute, this has received very little attention to date. It is a high priority because the archaeology is very subtle and therefore requires focused research strategies. This archaeology is also very fragile and thus threatened by increased visitor activity.

AREAS IDENTIFIED FOR FOCUSED RESEARCH

The area along Cottonwood Wash around and north of Bluff was given very high priority as a place people intensively used in the past that has not been well documented by professional archaeologists. Grand Gulch was identified as a particularly sensitive area that merits increased inventory and protections. The towers of Beef Basin need better documentation. They are fragile and have high research value.

HISTORIC ARCHAEOLOGY OPPORTUNITIES

There is substantial research potential for historic period archaeology and documentation projects that could engage area residents and visitors, including study of the Outlaw Trail, the Hole-in-the-Rock Trail, trapping and trappers, mining camps from the 1890s, historical oil-drilling settlements, and Navajo Long Walk sites. Inscriptions and graffiti from early archaeological expeditions and an array of other names of historical figures, dates, and other markings left behind have substantial and proven research and historical value. These are also fragile and threatened.

A drilling rig on Cyclone Flat, looking north-northwest toward Bears Ears. PHOTO: © ADRIEL HEISEY

Cultural Landscapes and National Monuments

The Antiquities Act of 1906 was signed into law just over eleven decades ago. The Act gives the president of the United States the authority to "declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Federal Government to be national monuments." Much has changed in the nation and in the ways we celebrate our diverse heritage since the Act's inception.

Much has also changed in the discipline of archaeology. As archaeology matured over the course of the past century, it became apparent that archaeological sites were actually a finite resource. Once destroyed by erosion, vandalism, or scientific excavation, an archaeological site is gone forever and cannot be restored. It also became apparent that new technologies and the accumulation of broader sets of information were sources of greater insights regarding the past than had been imaginable a century, a decade, or even a year earlier.

Equally important has been the recognition that spatial scale is of critical importance. People of the past lived on landscapes that were diverse physical and natural environments, and social networks were of vital importance to the success of ancient human groups. As a result, the landscape-scale approach has emerged as a central trend in archaeological approaches to the past.

It is essential to recognize that the places where archaeologists work and conduct research are the former territories of American Indian groups. Modern tribal groups have

Sunrise over two deep canyons in Bears Ears National Monument. The canyons that come together to create an isthmus with a promontory at its end. Note the wall remains in the middle foreground. PHOTO: © ADRIEL HEISEY

This is one of the most powerful elements of the landscape approach that a national monument such as Bears Ears offers: the opportunity for tribes and other stakeholders to collaboratively manage and interpret a rich and living tapestry of interrelated places.

strong connections to these places, and they often value different aspects of the Bears Ears National Monument landscape than professional archaeologists. Though this can lead to conflict, increasingly archaeologists, tribes, and other interest groups are finding that there are paths to common ground. This is one of the most powerful elements of the landscape approach that a national monument such as Bears Ears National Monument offers: the opportunity for tribes and other stakeholders to collaboratively manage and interpret a rich and living tapestry of interrelated places.

Bears Ears National Monument had multiple advocates, but the leaders were five tribes. Though these tribes were not always allies in the past, Bears Ears National Monument brought them together into new collaborative ways of working together. Archaeologists, environmentalists, the recreation industry, and many others have embraced this collaborative approach. Celebration of these living landscapes of the past—the core theme of this report—opens up creative approaches to landscape-scale conservation, recreation, and perhaps ultimately, social integration. Bears Ears builds upon a rich past, but even more, it opens broad opportunities for the future.

Aerial view of the same promontory showing structures at sunrise. PHOTO: © ADRIEL HEISEY

Two More Regional Maps

A landscape perspective on the Bears Ears area is not, in fact, a recent innovation. Over a century ago, archaeologist T. Mitchell Prudden prepared a report on the archaeology of the San Juan River watershed, including southeastern Utah. In his introduction, he commented that "it is both convenient and instructive to recognize large natural districts corresponding to the great drainage areas." We include here a redrawing of Prudden's map of the archaeology of the San Juan watershed (page 48). Bears Ears National Monument is shown, and the colored zones on the map show the distribution of clusters of archaeological sites across the landscape. Prudden encouraged attention to archaeological preservation in the closing sentence of his report: "It is to be hoped that steps may soon be taken to protect these relics of a most instructive phase of primitive culture, and that authorized and intelligent research may be encouraged to enter a field still full of the promise of most interesting discovery."

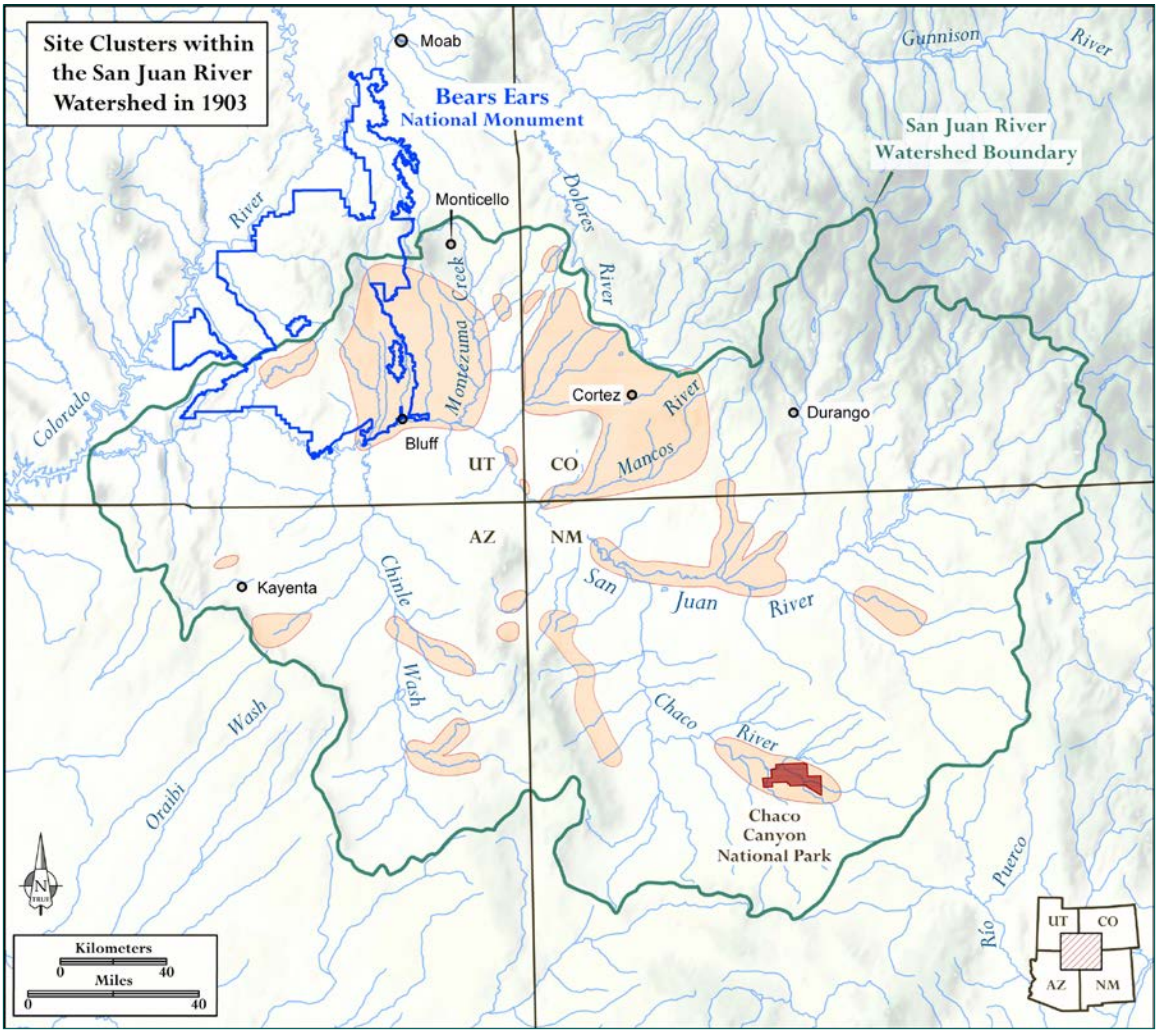
Although Prudden notes that he spent several years compiling his map, more than a century of subsequent archaeological investigations has ensued. Archaeology has emerged as a formal discipline with graduate programs in universities and an extensive private employment sector known as cultural resource management. Today, when an archaeologist takes a landscape-scale perspective, it is generally possible to access a state-level information repository where archaeological records are compiled from the wide range of contexts where archaeologists currently work. In Utah, the Antiquities Section of the Utah Division of State History manages that state-wide digital information source. In early 2017, personnel from the Antiquities Section compiled a map and tally of known sites within Bears Ears National Monument and within surrounding San Juan County that they recently made available to us. Review of that map (not reproduced here because it illustrates site location—though at an extremely coarse scale) provided two useful insights to highlight here.

First, one must use caution in making judgments about archaeological site density from a map of known sites. For example, the official Utah records are very incomplete south of the San Juan River on the Navajo Reservation, and they reflect large numbers of recent development projects in the area around Alkali Ridge, a National Historic Landmark, to the east of Bears Ears National Monument. Furthermore, many sites within Bears Ears National Monument are not yet entered in the Utah database, so density is underrepresented within the new national monument.

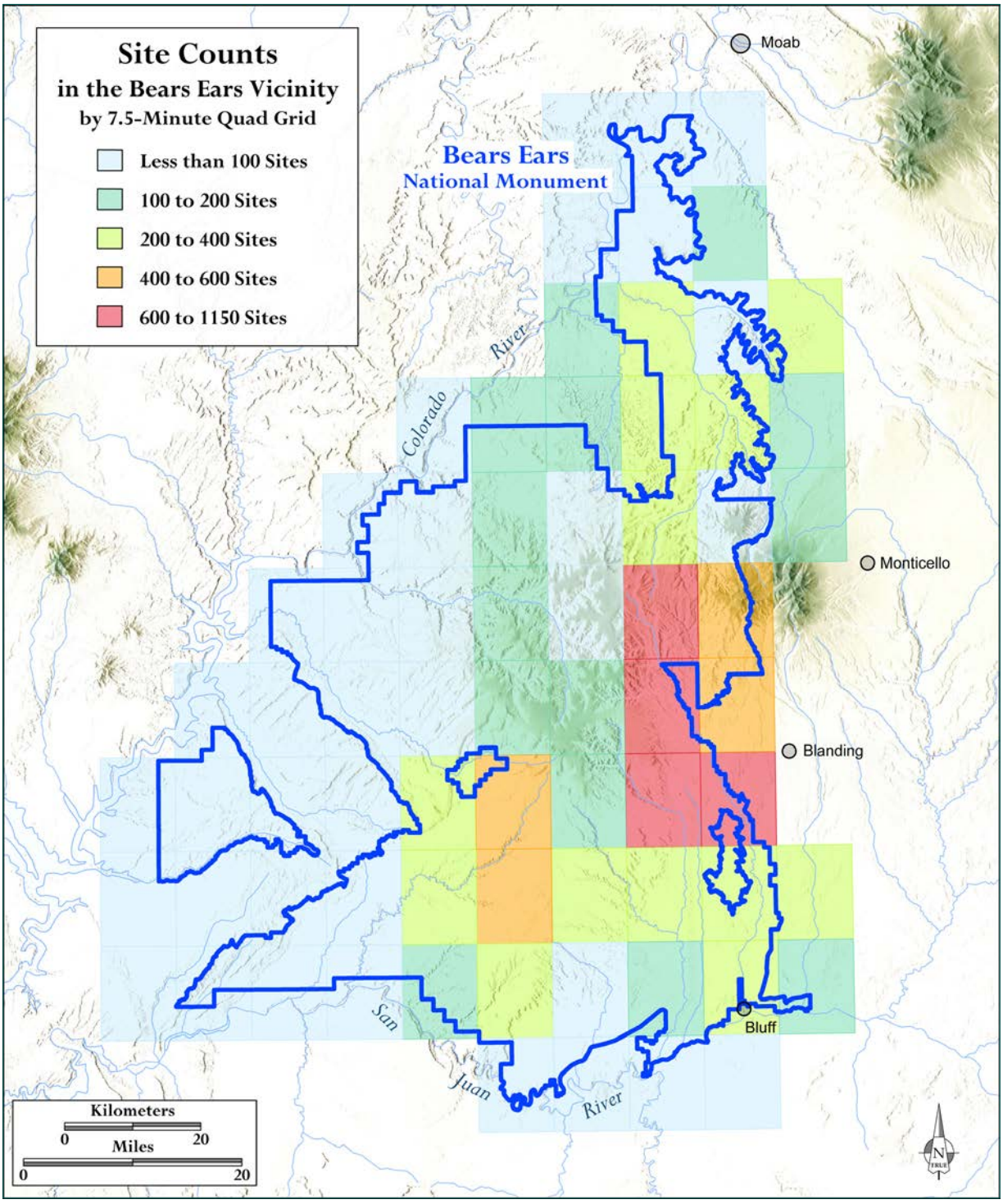
Second, and despite these caveats, this information was used earlier in this report to support the estimate that some 100,000 or more archaeological sites are likely to be present within Bears Ears National Monument (page 4). Moreover, the site distribution to the east of Bears Ears National Monument displayed on the Antiquities Section map supports the fact that the area between Bears Ears and Canyons of the Ancient National Monument, which starts at the Colorado state border, was once part of a continuous cultural landscape.

The Antiquities Section recently provided additional data on the number of sites known for each of the U.S. Geological Survey 7.5-minute topographic maps that intersect with Bears Ears National Monument. That information was used to make a map (page 49) of known site counts across the monument area. In many ways, this map reflects the intensity of past archaeological study. It also represents a dim reflection of the archaeological site density. For example, comparing this map with the information displayed on our series of "population intensity" maps as defined by the experts reveals a number of close correlations between past population intensity and the areas currently known to have higher site frequencies. This is valuable guidance, as long as we keep in mind that we currently know about roughly 10 percent of the sites that are present within Bears Ears National Monument.

The pairing of these two maps supports the value of a landscape perspective for archaeological research and for preservation efforts. A focus on those two core goals was the motivation for the Bears Ears Archaeological Experts Gathering—and we will continue to pursue these goals in Bears Ears National Monument in the future.



This map is a redrawing of a 1903 map of archaeological sites from the San Juan River watershed in the Four Corners area compiled by archaeologist T. Mitchell Prudden. Note that only about half of the Bears Ears National Monument falls within the San Juan watershed, which is why sites are not reported in the northern portion of the monument on this 1903 map. Prudden was an early advocate of a landscape perspective on archaeological resources, and many archaeologists have adopted this perspective over the ensuing century.



The Antiquities Section of the Utah Division of State History provided the count of known archaeological sites for each U.S. Geological Survey 7.5-minute-topographic-map that intersects or falls within the boundaries of Bears Ears National Monument. This map displays site counts per map in broad frequency intervals. This information strongly reflects past intensity of field survey, and to a limited extent conveys archaeological site density over Bears Ears National Monument. It is projected that a mere 10 percent of the national monument has been surveyed, and it is expected that more than 100,000 archaeological sites are present within Bears Ears National Monument.

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Final page: *Aerial view of the Bears Ears and part of the southern escarpment of Elk Ridge. Photo: © Adriel Heisey*

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BEARS EARS NATIONAL MONUMENT
Established on December 28, 2016

ATTACHMENT D

Modeling Archaeological Sites and Forest History on Cedar Mesa, SE Utah*

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Sept. 12, 2017

Introduction

Producing a model that successfully predicts archaeological site densities over a large area of more than 1,000,00 acres which had diverse prehistoric adaptations and diverse environments is an extremely difficult task. Recently such an attempt has been done for the Monticello BLM area (SWCA 2016). With the difficulties in mind, it is not surprising that this attempt has aspects which can be shown to be incorrect for specific areas. This is the case for the Cedar Mesa area within the Bears Ears NM according to existing high quality archaeological information which is largely publicly available . The "sensitivity" maps produced (in particular Fig. 8-4, 5 and 8) are significantly in error for Cedar Mesa where we have worked together since 1970 . These maps (Figure 1, 8-5) show the spine of the mesa, along Utah 261, being an area of low site density, while our work has demonstrated that this area is, instead, the environment of highest site density. Many of our publications and reports have so argued, beginning in 1971, when planning the Cedar Mesa project [CMP] (Lipe and Matson 1971), progress reports (Matson and Lipe 1975; 1978) and final summary (Matson, Lipe and Haase (1988) and detailed monograph available on line (Matson, Lipe and Haase (1990) as well as many more specialized reports, MA theses and PhD dissertations (see Matson, Lipe and Haase 1988 and Lipe and Matson 2009) for lists). These publications include several in the last few years, Morin and Matson (2015), Lipe et al. (2016), Matson, Lipe and Curewitz (2016), and Lipe (2014).

One way of showing the difference between the predictive modelling and the actual site densities is to use a site definition used by the predictive modelling and compare it with the Cedar Mesa Project equivalent(s). We chose to use to compare the "Prehistoric Open sites with Features" (Figure 1,Fig. 8-5) predictive modelling class using the combination of Basketmaker II (BM II), Basketmaker III (BM III), and Pueblo II-III (PII-III) habitation site classes we developed for our research as the Cedar Mesa equivalent as this appeared to be the closest fit. These three kinds of habitations sites, by definition, are always "Prehistoric", almost always "Open" and either have significant features visible on the surface, or are inferred to have pithouses present.

Doing this and plotting the site densities per quadrat to three different elevation classes results in Figure 2, "Cedar Mesa Density of 'Prehistoric Open Sites with Features'." One can see that this figure is essentially reversed from that shown by the predictive modelling (Figure 1

* This paper was delivered at the 14th Biennial Conference of Science & Management on the Colorado Plateau & Southwest Region at Flagstaff, Sept. 11-14, 2017.

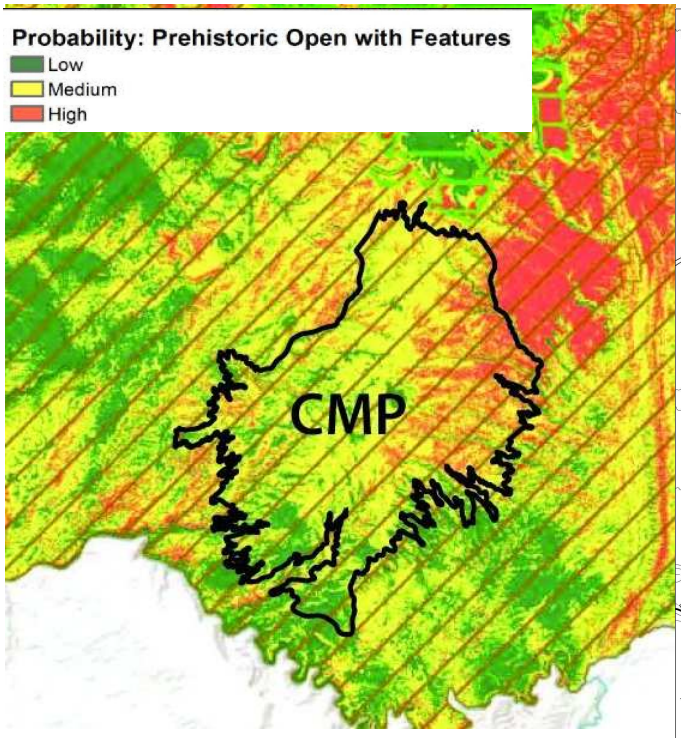


Figure 1. SWCA Figure 8.5 (cropped).

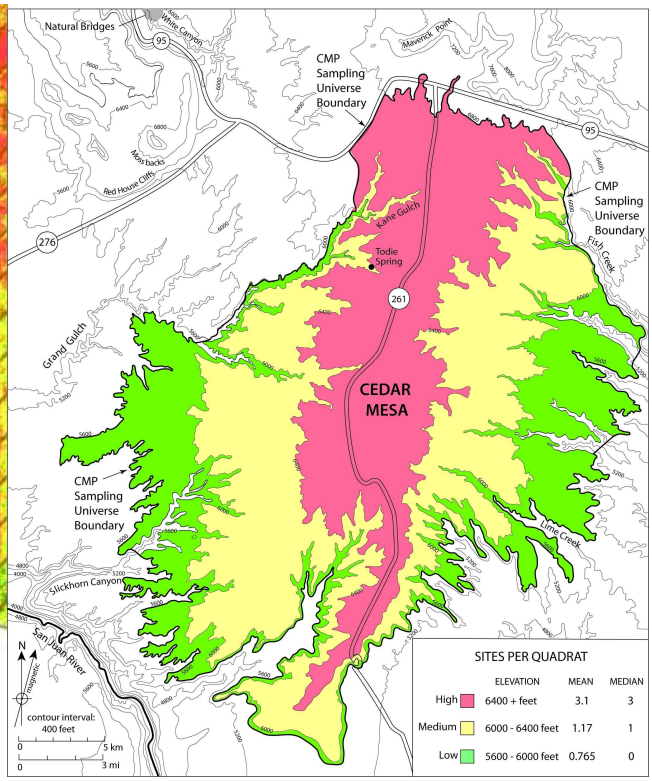


Figure 2. Cedar Mesa "Habitation sites".

Fig. 8-5) for this area, with the spine of the mesa having a density of four times of that of the 5600-6000 ft. elevation band on the flanks of the mesa. Such a startling difference obligates a brief discussion of how this Figure 1 was derived and thus, the Cedar Mesa Project sampling scheme.

<u>The Cedar Mesa Project.</u>

The Cedar Mesa Project (CMP) sampling universe was based on Lipe's experience working in SE Utah. His experience led him to believe that the "Anasazi" farming adaptation would be captured on by the elevations of 5600 ft. and 6800 ft. and that the "drainages" made natural units of some integrity. We therefore designed a sampling universe along those lines, including the canyons, by drawing lines at canyon mouths across from the neighboring 5600 ft. contours, as seen in the Figures 2 and 3. This scheme inclosed an area of about 800 square kilometers, or approximately 200,000 acres.

We randomly selecting 5 of the 20 drainages, as shown on Figure 3. We random sampled each of the five drainages at a 7% rate, using quadrats 400 metres on a side, resulting in samples sizes in each drainage ranging from 9 quadrats to 22 and a total of 76 in all.

We not only surveyed the quadrats, but mapped and completely collected almost every site. The maps provided a way of setting up collection grids and collection locations so that almost every object can be located to within 1 metre or so of its original location. Specific forms (published in Matson et al. 1990) were also filled out for the botanical, physiographic and cultural information. Summaries for each quadrat and site are available on-line as part of Matson et al. 1990.

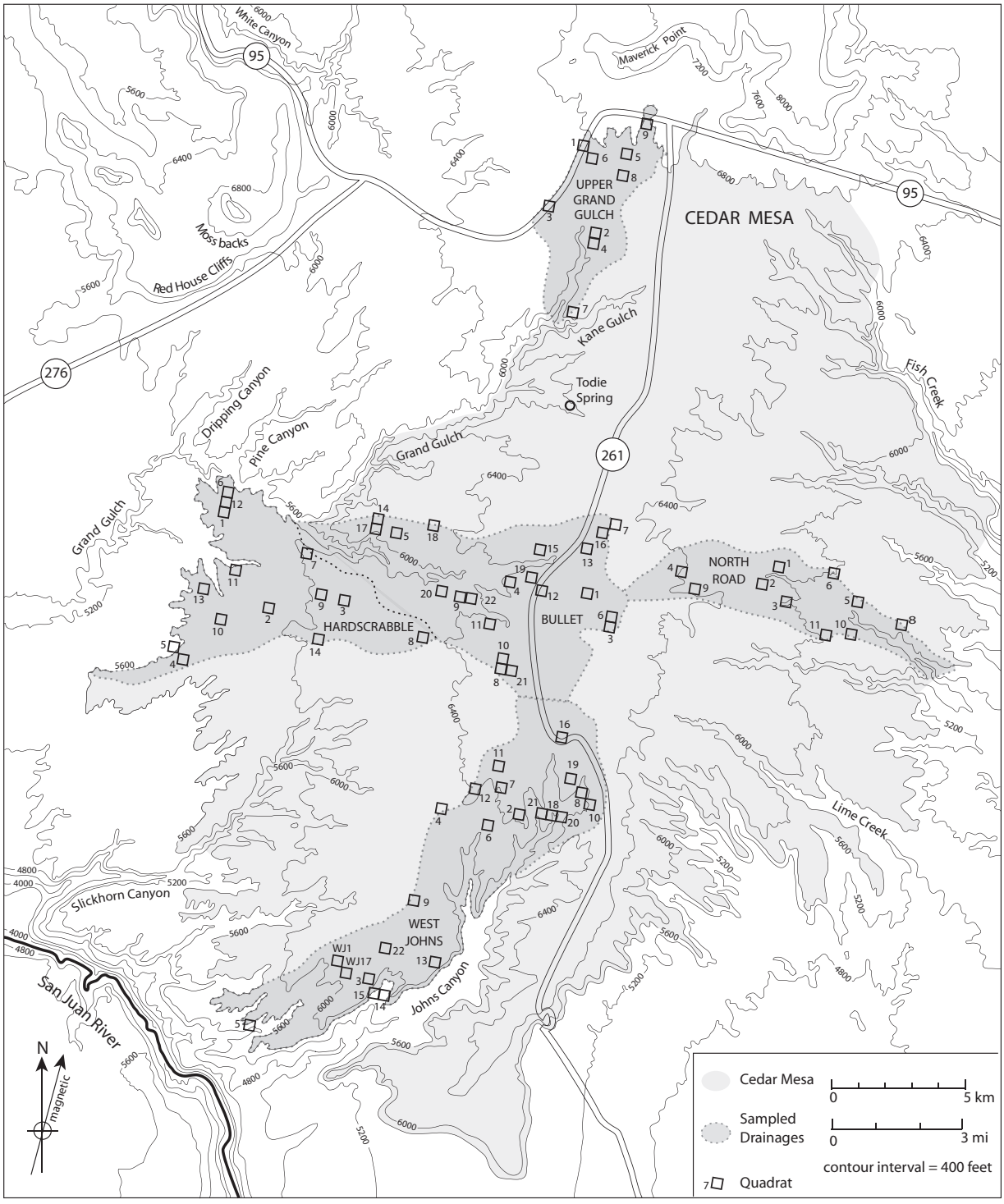


Figure 3. Location of CMP drainages and quadrats (Matson et al. 1990:Fig. III-2).

The production of the CMP Sensitivity Figure

We simply totalled up the habitation sites for the three periods (BM II, BM III and PII-III) for each quadrat for Figure 2. The three bands illustrated on the Figure 2 was produced by dividing the 1200 ft. elevation range into three 400 ft. groups. The 5600-6000 ft. group included 17 quadrats, with a mean of 0.765 sites of this class per quadrat and a median of 0.

Actually only 5 of the 17 quadrats had any "Prehistoric Open Sites with Features" in them.

The next group, 6000-6400 ft., included 29 quadrats and has a mean of 1.17 and a median of 1 site per quadrat. Eighteen of these quadrats had habitation sites. The final group (6400 - 6800 ft.) consisted of 30 quadrats, with a mean of 3.1 and a median of 3 "habitation" sites per quadrat. An impressive 28 out of 30 quadrats had at least 1 "habitation" site.

These figures make it clear that the "spine" of the mesa is the portion with the highest density of the most significant sites the reverse of the predictive model (Figure 4 [1&3 side by side]). The only significant caveat is that many of our CMP limited activity sites do have "features" and so, at least , would also fit the draft report site class but those sites have a similar elevation distribution as the habitation sites (Matson et al. 1988).

Extension of Cedar Mesa Pattern?

As disturbing as the maps(SWCA 2016:Fig. 8-4, -5 and -8) showing the spine of Cedar Mesa as an area of relatively low site density are, the depictions of relatively high site densities in low-lying arid regions south and southwest of Cedar Mesa and outside of our sampling frame in the same figures are more so. Showing significant site numbers in areas such as Valley of the Gods at elevations below 5000 ft. are errors. We know from a recent conference that there isn't any significant site density there.

The contract work closely related to the CMP reported in Lipe, Matson and Powers, 1977 allow us to expand Figure 2. This project included non-collection quadrat surveys in two areas (Figure 4), the Pine and Dripping Canyons, to the west of the Cedar Mesa Project sampling universe and the Slickhorn area, between Hardscrabble and West Johns, mostly within the sampling universe, but a drainage that was not sampled by CMP. These quadrat surveys used the same quadrat size, approximately the same sampling rate and survey procedures as the CMP.

In the Slickhorn area, the 23 quadrats produced 23 sites. All but two of the total 23 Slickhorn components were classified as BM II sites and the other two as Pueblo II-III. Very few of the 23 sites, if any, would be considered "habitation" sites.

The Pine-Dripping Canyon survey gives rather different information from the 24 quadrats surveyed. All are outside the Cedar Mesa Project sampling universe and can be used to estimate the number of sites in the area between Cedar Mesa and the Red House Cliffs. Sixteen quadrats were in the elevation band between 5600 and 6000 ft. and only three possible habitation sites, all BM II, were located giving a mean of 0.19 per quadrat. The other eight quadrats between 6000 and 6400 ft. produced 11 possible habitation sites, giving a mean of 1.4, close to the 1.17 produced by the CMP for this elevation band. Four of these were BM II and 7 PII-III. No quadrats had an elevation greater than 6400 ft.

It is clear that the area west of the Cedar Mesa sampling universe, east of the Red House Cliffs and south of the 5600 ft. contour line to the San Juan River will have very few sites, and most of those will be BM II Limited Activity Sites (Figure 5). The elevation between the 6000 and 6400 ft. will be similar to the same elevation band on Cedar Mesa, as shown by the Pine Dripping Canyon quadrat survey. with likely slightly more than one habitation site per quadrat.

There remains the band above 6400 ft. between the northwest edge of the CMP defined project area and Natural Bridges National Monument. Although the Extension survey did not cover any of this area, it is also immediately adjacent to the Upper Grand Gulch drainage,

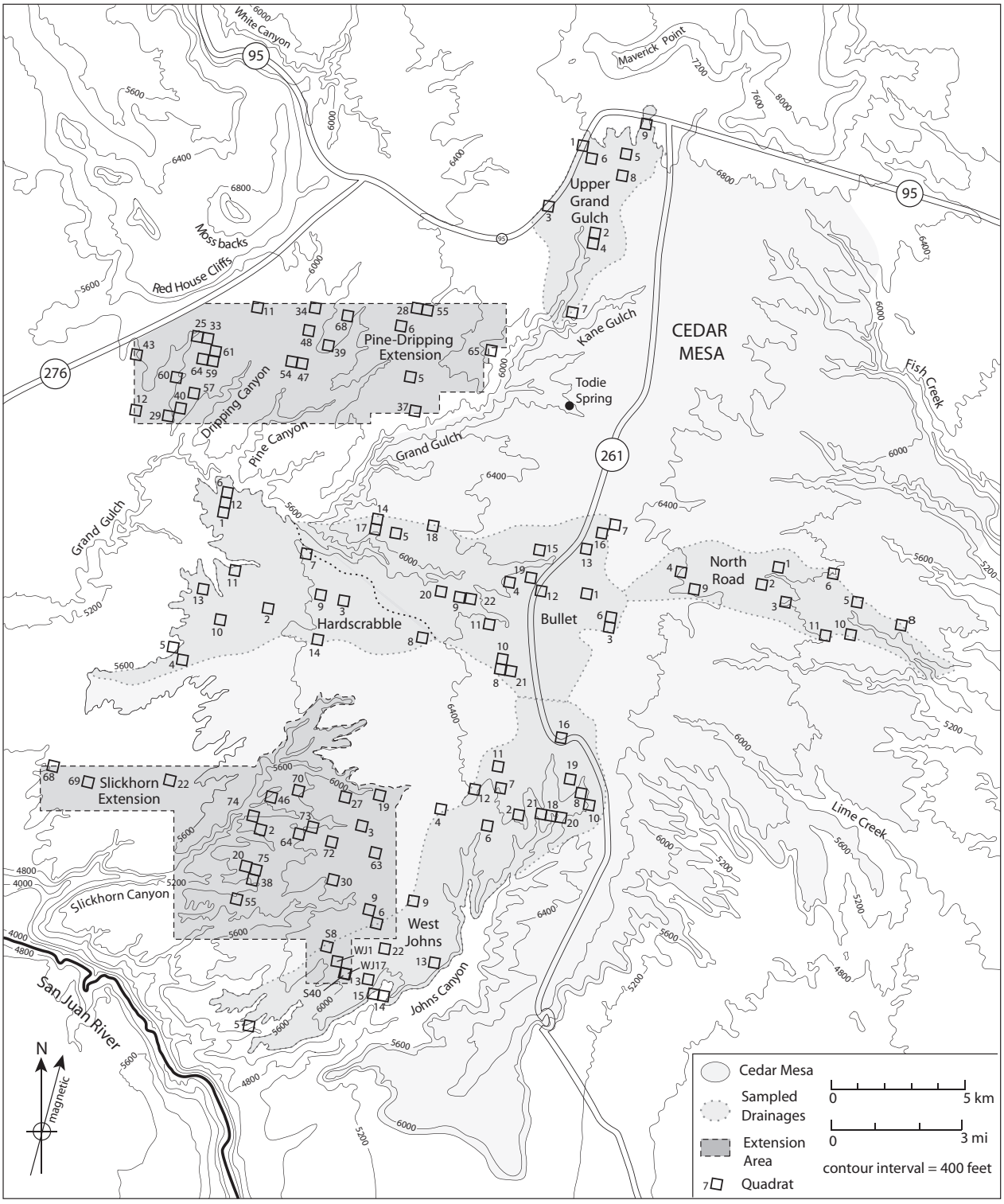


Figure 4. Grand Gulch Extension Quadrats (Matson et al. 1990:Fig. IV-1a).

which was sampled during the CMP. Nine quadrats were surveyed there and all were between 6400 and 6800 ft., producing an average 2.33 "Prehistoric Open Sites with Features" per quadrat. Either this figure, or the overall CMP 6400-6800 ft. figure of 3.1 sites, indicate that

band between Upper Grand Gulch and Natural Bridges is a high density area.

Thus we can legitimately produce Figure 5 showing the 'extension' of the elevation bands to the west and northwest of the CMP project area, showing three levels of site density, with an implied fourth, the area below 5600 ft. with an expected site density of far less than half of that between 5600 and 6000 ft. The 5600-5800 ft. band in the Cedar Mesa sampling frame averaged only .18 habitation sites per quadrat.

The area to the south and southeast of Cedar Mesa to the San Juan river has also been filled in as a very low density area. That does not mean that there are not important sites there (The Lime Creek Clovis site, for example) but that the site density is very low.

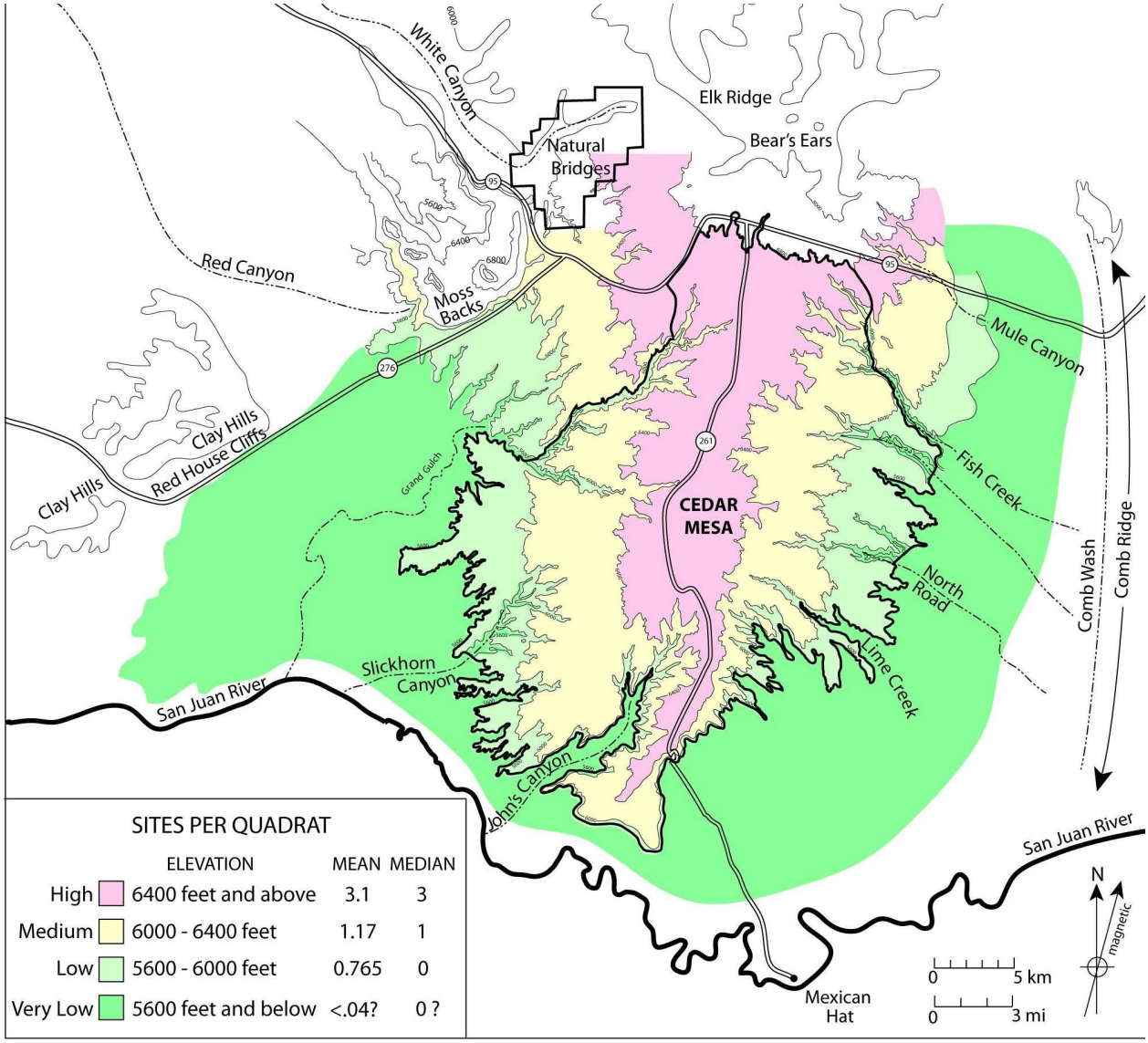


Figure 5. "Extended" CMP Sensitivey Map.

Origin of the "Cedar Mesa Pattern"?

We complete this section with a more inferential issue, what is producing the Cedar Mesa site distribution? First, this pattern is produced by rainfall dry farming, known best today in the bean and winter wheat farming areas between Monticello and Cortez. For rainfall dry farming you need sufficient precipitation, enough warm days and a deep, absorbent soil. On Cedar Mesa one has an sandy aeolian soil that stores water well. It is not, though, evenly distributed on the mesa. Elevation is not the most sensitive environmental variable we found; instead the amount of dense Pinyon-Juniper in a quadrat was (Figure 6). Like elevation, the presence of abundant Pinyon-Juniper is also a proxy measuring precipitation and temperature, but it also occurs only on deeper soil, the other critical variable. This was the adaptation for 1100 years on Cedar Mesa, the differences, including the hiatuses and the various settlement patterns were probably as much due to changing climate as anything else.

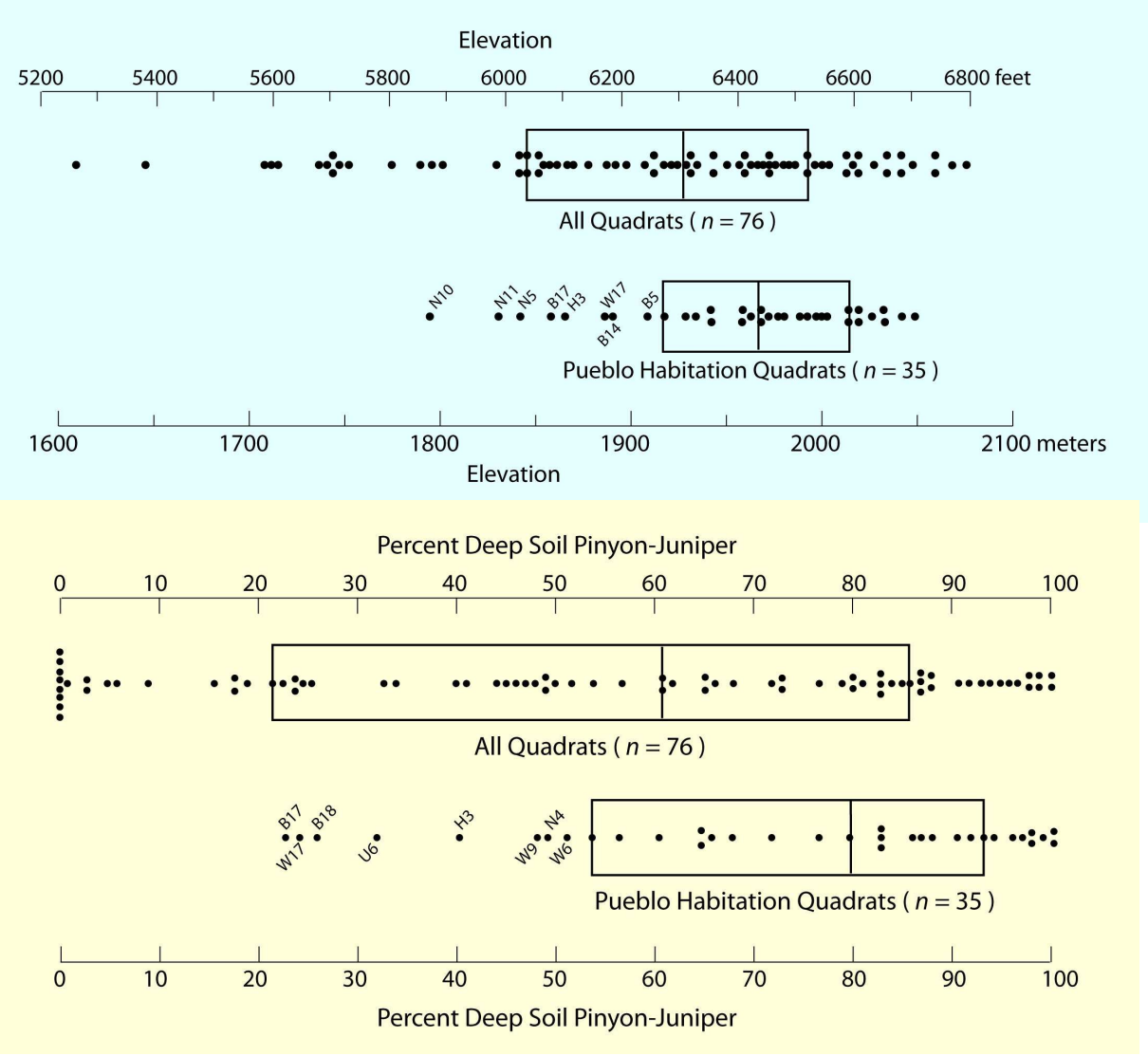
We are not objecting to producing sensitivity maps. We in fact developed a linear regression model using elecvation and percent Dense PJ that works well with elevations up to 6800 ft. It is also consistent with the CMP based site densities. This equation is shown at the bottom of Figure 6.

Flood water and slope runoff farming is important in some of the larger washes east of Cedar Mesa, e.g. Comb adjacent to Cedar Mesa and further east in the Butler, Cottonwood and Recapture Washes, and Montezuma Creek. Brooks' (1975) MA on Horse Flats, to the northwest of Cedar Mesa, shows that flood water farming was important (probably in combination with dry farming) there, and Milk Ranch Point to the northeast shows dry farming, but not at the same time that Cedar Mesa was occupied. So this simple model is very good for Cedar Mesa, and many other places, but others, some quite nearby, are very different.

After critiques from us and many others a revised modelling scheme was recently developed and the large MFO area divided into a number of areas, one called "Cedar Mesa". Unfortunately (Figure 7) it has a new set of problems, showing abundant sites where none exist.

Modelling Conclusions

The attempts to modelling "sensitivity" in the greater Cedar Mesa region are failures, grossly inaccurate. In spite of long existing information about the site distribution in this area, much of it published in peer review literature and with detailed information available on line for more than a decade, it was not used in developing or testing the models. Is this a failure of archaeological infrastructure, where the expertise to do this kind of work and the needed local knowledge falls between academic, bureaucratic and contract archaeology? Or as others have suggested, is it the results of decades underfunding of management units, so that the crucial information is lost in backlogs never digitized and thus invisible when needed? In any event, one fears the results if the sensitivity maps are ever used.



Linear Regression Model

n of habitation sites = -7.32 + 0.0238 (% Dense PJ) + 0.001254 (Elev in ft.)

$r^2 = 0.368$

Example, 5600-5800 ft, actual n of habitation sites is 0.18, predicted 0.22

Figure 6. Elevation and % Dense P J of CMP Pueblo II-III Habitation quadrats (from Matson et al. 1990 Fig. XI-1,3) and Linear Regression Model.

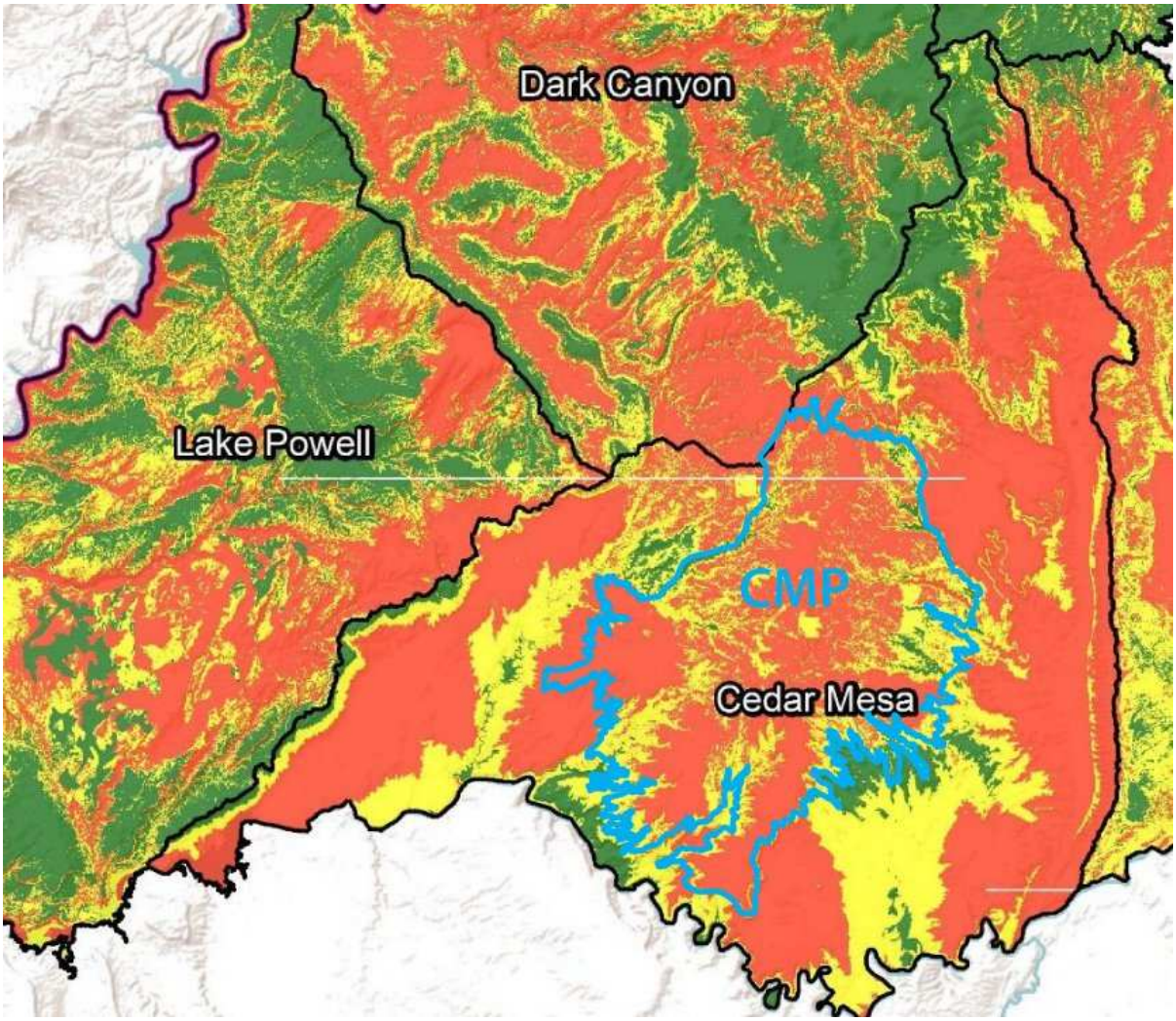


Figure 7. "Revised" Cedar Mesa area Sensitivity map. (After SWCA 2017: Figure 8-13).

Encroachment of Pinyon and Juniper

Land managers seem to agree that Pinyon and Juniper are invading the highly valued environments that produce grass. Looking beyond the strangely military language, "invade", "encroachment" noted by Bryan Hockett it is apparent that much P J has been there for a very long time. In 1973 Lipe planted a corn plot on Cedar Mesa slashed and burned the previous year (Figure 8). As part of this experiment he sent sections of the wood from the plot and from a nearby surveyors line recently cut (1970) to be tree-ring dated and some 100 were.

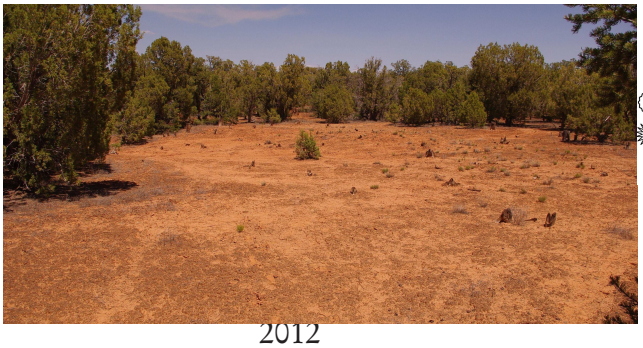
From time to time we have taken photos (Figure 9) of the plot and mapped what was present. The photos show almost no "rejuvenation". The P J that has come back with two exceptions was from stumps that were not killed when cut and burned. The two exceptions were one pinyon seedling and one juniper seedling, seen in Figure 10. Neither made it. Not much encroachment going on here in 45 years.

The age profiles of the 100 dated samples look like this (Figure 11).
The median and average ages are in excess of 200 years, and the third quartile is nearly 300

Figure 8. Todie "Slash and Burn Plot" 1973

1982

1992



2012

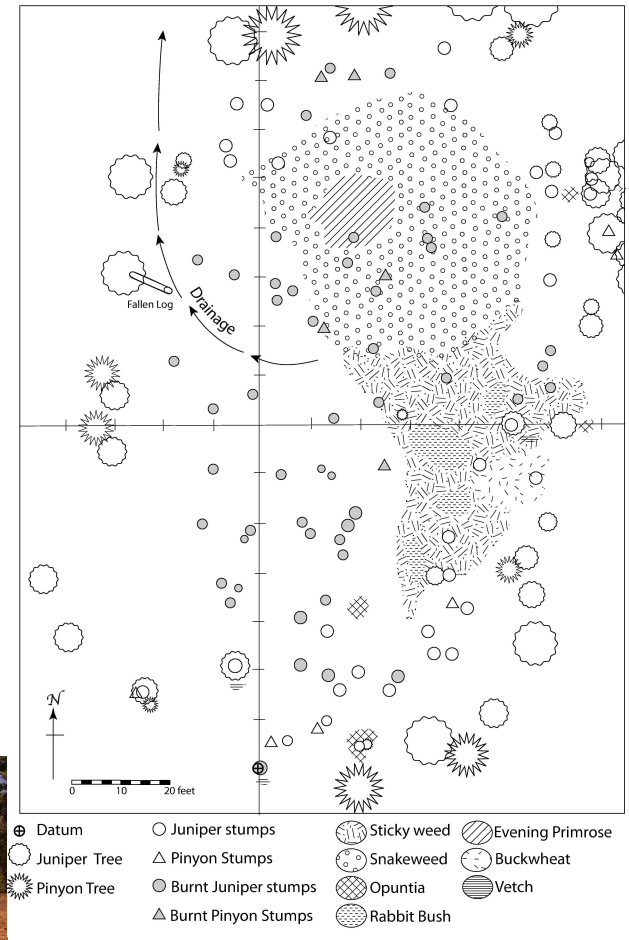


Figure 9. Todie S/B Plot photographed at different years and 1992 map of plot..

Figure 10. Juniper and Pinyon Seedlings in 1992

years. Only 3 were less than 50. Since many of these trees were junipers with centers that had decayed, these are underestimates of the actual age of the trees. The oldest one is more than 450 years old with the first counted ring being laid down in 1491.

The Todie plot is in a good, deep soil area at about 6560 ft. in elevation, but not in anyway untypical of that elevation on Cedar Mesa. This is the lower end of the most densely occupied part of Cedar Mesa as discussed in the first section of this paper. We expect similar results elsewhere at similar elevations on Cedar Mesa.

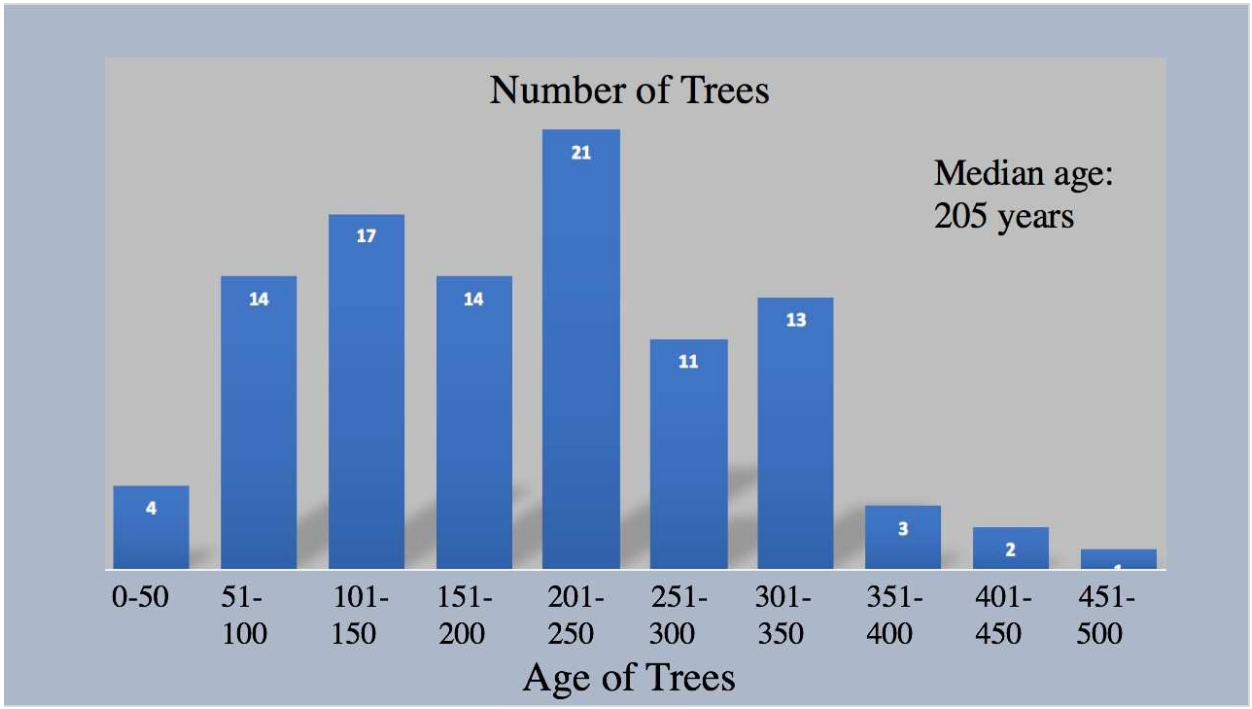


Figure 11. Histogram of trees from Surveryor's Line and Todie S/B Plot.

This is a very slowly regenerating woodland. The failure of the single juniper and pinyon seedlings to survive the middle 1990s may be the result of climate change, but even if they survived, the message they give us would be the same. In 1972, the well-known plant ecologist , Jack Major, cored some small PJ that appeared to be "encroaching" into the sagebrush flats and was surprised to see how many rings there were in the spindly specimens. The dates of the PJ recovered subsequently were not surprising. If "encroachment" is to be used, it would be more appropriately be used in terms of modern day harvesting of these old trees.

Pinyon-juniper forests sometimes burns as happened recently on Mesa Verde N.P. In our experience on Cedar Mesa (now jointly over 100 years) this is not a problems as lightning caused fires self-limit their extent to no more than several dozen trees. Thinning trees to lower fire risk does not make sense in this environment, although this may change if extensive beetle kill reoccurs.

General Conclusion

In the last 150 years our ability to understand our surroundings has greatly exceeded our ability to put this new knowledge to good use. The vast increase in understanding the nature of archaeology and the distribution of archaeological remains and past environments that came into being with the "New Archaeology" introduced more than 50 years ago is not being integrated into land management practices. In particular the relevant local information seems often to have been ignorned. The data we obtained in the CMP (1972-1975) was first summarily published in 1978 (Matson and Lipe 1978), not quite four decades ago. The quadrat elevations and percent dense PJ data used in the first part of this paper are from tabulations dated 1982.

The issues about the PJ were raised in public meetings with land managers in the 1970s. Much has changed for the better since then, but we appear to have a serious problem in locating the appropriate knowledge and information when it is needed for practical applications.

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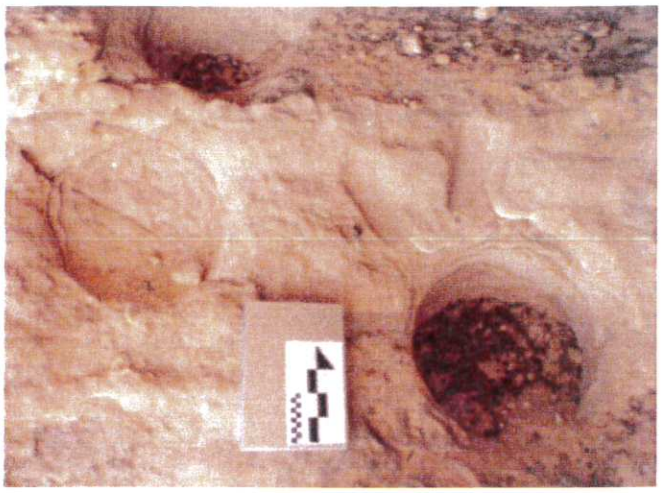
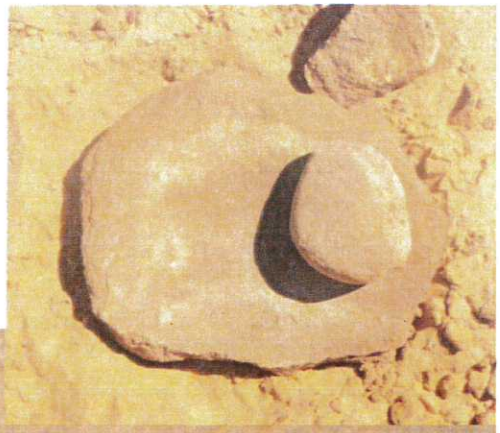
2017 (July) Class I Cultural Resource Inventory of Lands Administered by the Bureau of Land Management, Monticello Field Office (Draft).

ATTACHMENT E



From Meadow to Mesa

Class III Inventory in the Meadow Canyon Confluence Area, Kane County, Utah



By

Jerry D. Spangler

and

Matthew Zweifel

October 2016

From Meadow to Mesa:

Class III Inventories in the Meadow Canyon Confluence Area, Johnson Canyon, Kane County, Utah

By

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Report Prepared for:

Grand Staircase Escalante National Monument
Kanab, Utah

October 2016

Department of Interior Permit: BLM Administrative
Utah State Project Number U-13-C1-0048

Abstract

In March and April, 2013, the Colorado Plateau Archaeological Alliance (CPAA) and the Grand Staircase Escalante National Monument (GSENM) conducted Class III inventories of 680 acres of Bureau of Land Management-administered lands in the Johnson Canyon area, specifically the area near the mouth of Meadow Canyon, a northeast-to-southwest tributary to Johnson Canyon, Kane County, Utah. This inventory was conducted to assist GSENM in the fulfillment of its Section 110 responsibilities, to better understand the nature of prehistoric land-use patterns in the area, and to ascertain the nature and extent of anthropogenic impacts to archaeological sites eligible for the National Register. A total of 46 sites were prehistoric in nature, three had historic and prehistoric components (historic inscriptions), and three were historic sites associated with traditional ranching activities in the area since the 1880s. Based on surface evidence alone, most sites were either Archaic or Basketmaker II aceramic sites located on the mesa top or they were sites attributed to Ancestral Puebloan occupations during Pueblo I to Pueblo II times, based on the presence of certain ceramic evidence, that occur on the mesa top and on the ridgelines extending from the mesa to the meadow below. Most sites appear to be oriented towards agricultural production on the mesa top and perhaps around the meadow itself (the meadow is on private property and was outside of our inventory block). Approximately 42 percent of all sites investigated have suffered some form of anthropogenic impacts ranging from vandalism to unauthorized OHV travel that have degraded and in some instances continue to degrade the National Register qualities of the sites. All 52 sites are herein recommended as eligible for listing on the National Register of Historic Places.

Table of Contents

List of Figures

List of Tables

Background

In March and April, 2013, the Colorado Plateau Archaeological Alliance (CPAA) and the Grand Staircase Escalante National Monument (GSENM) conducted Class III inventories of 680 acres of Bureau of Land Management-administered lands in the Johnson Canyon area, specifically the area near the mouth of Meadow Canyon, a northeast-to-southwest tributary to Johnson Canyon (Figure 1), all in Kane County, Utah, about 9 miles east of Kanab. Although several archaeological sites are known in the general area, none of inventory block had been previously subjected to archaeological investigations of any kind.

In general, this inventory was conducted through a cooperative agreement between CPAA and GSENM to collect cultural resource data to facilitate more proactive management of lands within the political boundaries of GSENM, and to better understand prehistoric land-use patterns in the Grand Staircase area. The inventories were not related to any undertaking, but rather they were research in nature and were initiated to assist GSENM in the fulfillment of its Section 110 obligations under the National Historic Preservation Act.

Most of the inventory was completed between March 12 and March 17, 2013, by volunteer crews working under the direction of GSENM archaeologist Matt Zweifel and CPAA Executive Director Jerry D. Spangler. They were assisted by CPAA archaeology crew chiefs Tanner Whetstone and Peter Yaworsky, and the volunteer crews were comprised mostly of University of Utah graduate students in anthropology and monument staff. Several sites identified during the March inventory were not documented at that time due to time constraints, and Whetstone and Zweifel returned to Meadow Canyon at several points during April and May 2013 to complete documentation of these sites. A total of 52 sites were documented during the course of our investigations (42Ka7540 to 42Ka7561, and 42Ka7563 to 42Ka7592). The inventory was conducted pursuant to authorities granted under GSENM's cultural resource permit and Utah State Project Number U-13-C1-0048.

The inventory block, as defined by monument staff, is located on the east side of Johnson Canyon between the eastern tributary of Long Canyon on the north and the mouth of Meadow Canyon on the south. This area is located at the intersection of four different U.S. Geological Survey 7.5 minute quadrangles (Cutler Point, Thompson Point, Pine Point, and Johnson Lakes), all within Township 42 South and Range 5 West of the Salt Lake Meridian. The project area (see also Table 1) is generally located in the Wygaret Terrace area, a prominent feature within the Grand Staircase physiographic unit as defined by Stokes (1986).

Township 42 South Range 5 West	Section 25	N ½	320 acres
Township 42 South Range 5 West	Section 25	NW ¼ of SW ¼	40 acres
Township 42 South Range 5 West	Section 26	NE ¼	160 acres
Township 42 South Range 5 West	Section 26	N ½ of SE ¼	80 acres
Township 42 South Range 5 West	Section 26	SE ¼ of SE ¼	40 acres
Township 42 South Range 5 West	Section 35	NE ¼ of NE ¼	40 acres

Table 1: Quarter sections subjected to Class III Inventory.

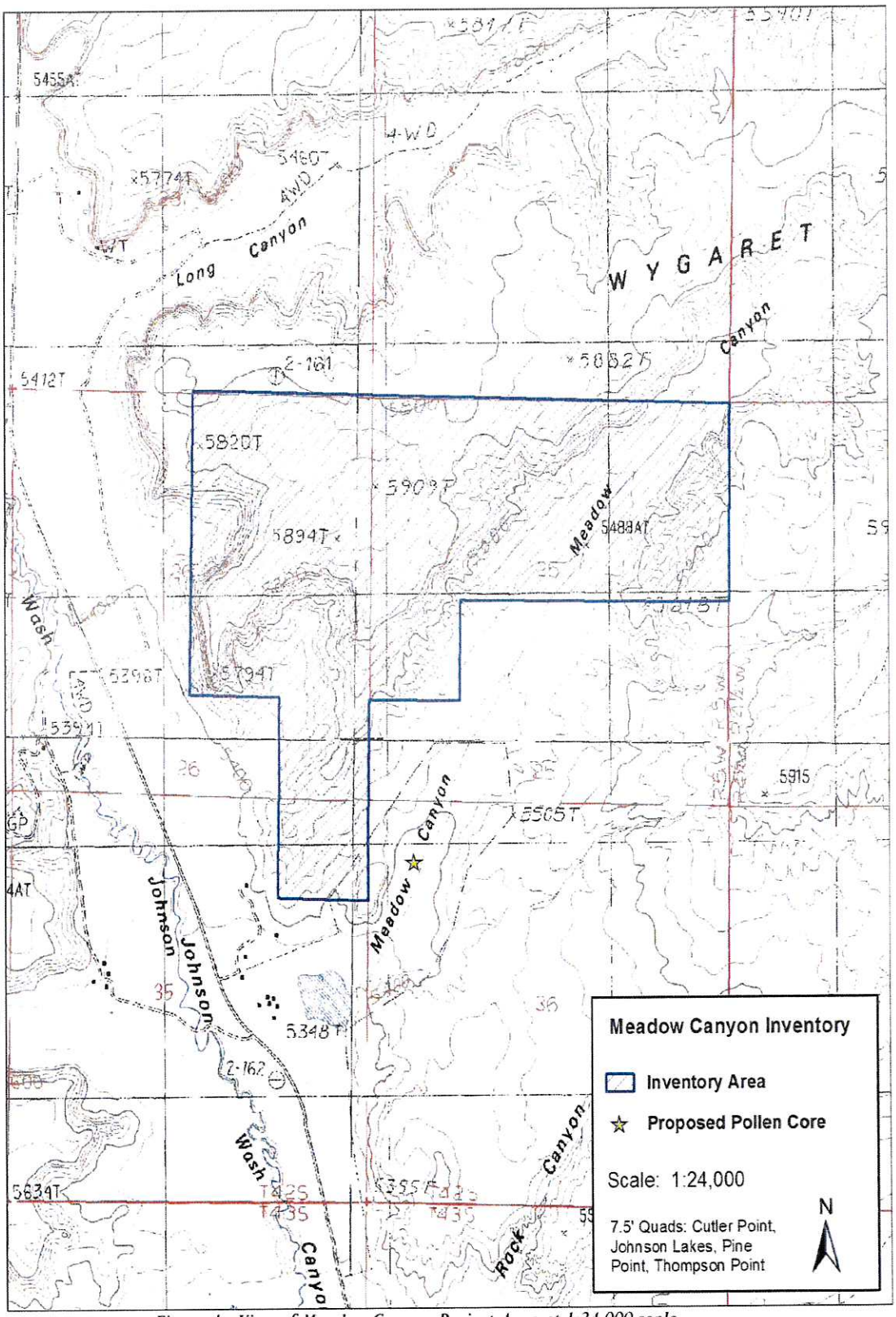

Figure 1: View of Meadow Canyon Project Area at 1:24,000 scale.

The inventory was actually part of a two-phased research project. Our investigations were intended to establish baseline inventory on the nature and distribution of prehistoric sites in the project area. A second study conducted concurrently by Northern Arizona University (NAU) involved the removal of pollen cores from bogs in Meadow Canyon to facilitate paleoenvironmental reconstructions of prehistoric climates in the area (see the yellow star on Figure 1 above). The nature of prehistoric climates can assist researchers to better understand changing land-use patterns through time and in response to changing environments. For example, our inventory data suggest two periods of relatively intense occupation of the study area that included dry farming of the mesa top, one during Basketmaker II times and another in late Pueblo II times. The paleoenvironmental data can help identify conditions that would have facilitated or constrained dry farming in this area, whether or not those conditions were static through time, and whether or not anthropogenic manipulation of the local environment is evident (e.g., burning of the pinyon-juniper canopies to facilitate agriculture).

The objectives of the 2013 inventory were threefold:

- Complete Class III-level inventories of the defined project area to determine the nature and distribution of prehistoric sites as they related to various topographic variables (e.g., sites on the mesa top versus the foothills), and when possible to assign temporal and cultural affiliation to those sites.

- Examine prehistoric site data from the study area within the context of what is known about the prehistory of Johnson Canyon and the greater Grand Staircase region.

- Determine the nature and extent of adverse anthropogenic impacts and/or vandalism that have occurred in the area (all human-related factors that have contributed to the degradation of the National Register eligibility of sites), and to offer management recommendations to GSENM managers.

The following report, which details our observations at all 52 sites, should be viewed as a companion report to the NAU paleoenvironmental study (D'Andrea 2015). Our analysis of site temporal and cultural affinity, as discussed in the Cultural Context section, should also be considered preliminary as it is based only on surface evidence. Additional investigations (e.g., test excavations) at these sites could warrant modifications to our assessments and initial conclusions.

Archaeological investigations were conducted utilizing standard archaeological survey and documentation techniques (e.g., Banning 2002; Molyneaux 2005). Archaeological and historic sites were documented on standard IMACS forms required by the state of Utah, and site locations were plotted on U.S. Geological Survey 7.5 minute topographic maps. Additional site condition data were also collected. A total of 46 sites were prehistoric in nature, three had historic and prehistoric components (historic inscriptions), and three were historic sites associated with traditional ranching activities in the area since the 1880s. A few pieces of obsidian were collected by GSENM staff for source analysis, but no other artifacts were collected and cultural deposits were not disturbed in any way. Approximately 42 percent of all sites investigated have suffered some form of anthropogenic impacts ranging from vandalism to unauthorized OHV travel that have degraded and in some instances continue to degrade the National Register qualities of the sites. All 52 sites are herein recommended as eligible for listing on the National Register of Historic Places. The location of all 52 sites is indicated in Figure 2.